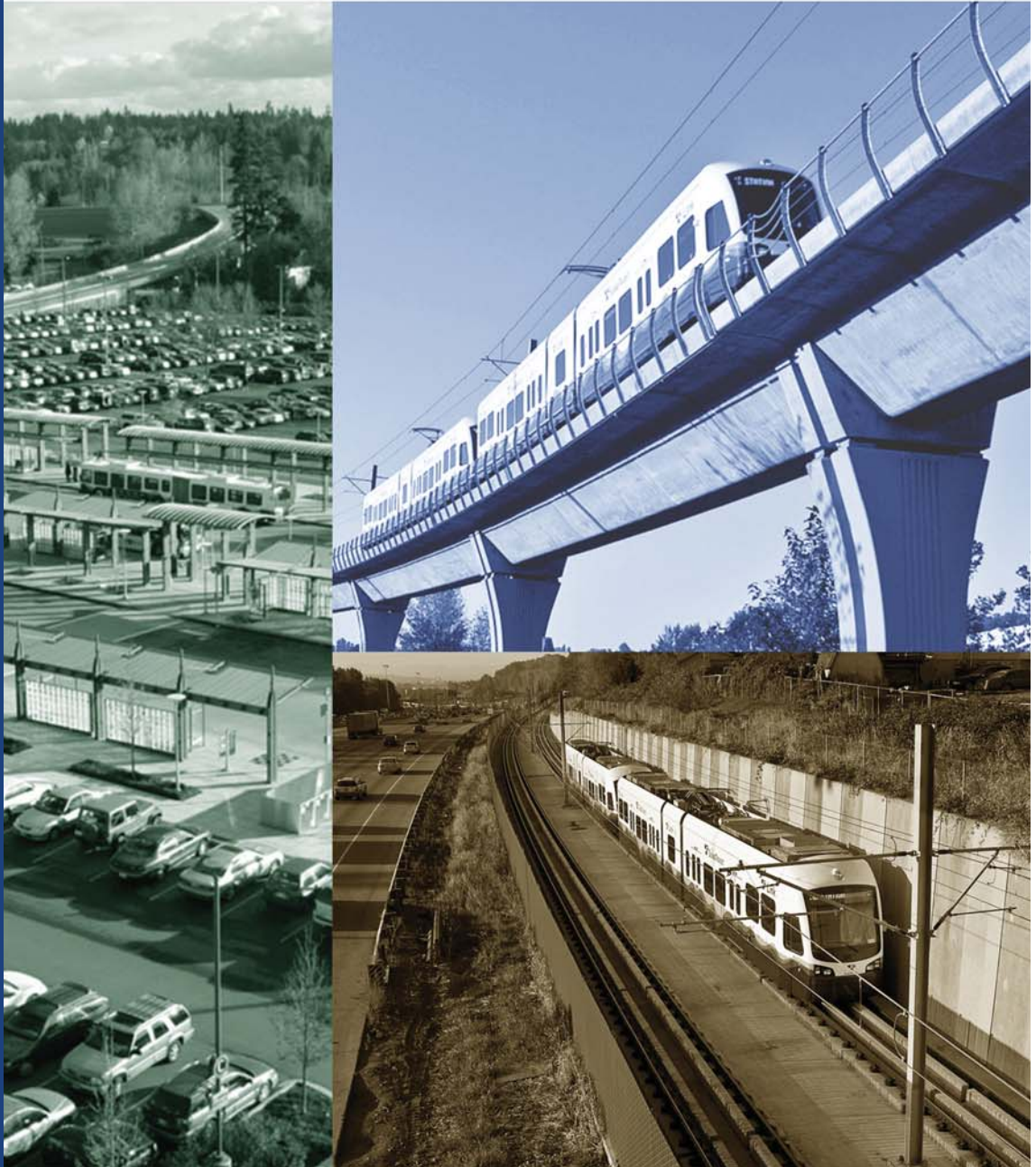


LYNNWOOD LINK EXTENSION

FINAL ENVIRONMENTAL IMPACT STATEMENT

Transportation Technical Report



 **SOUNDTRANSIT**

 U.S. Department of Transportation
Federal Transit
Administration

APRIL 2015



Lynnwood Link Extension

Technical Report Transportation

401 South Jackson Street
Seattle, WA 98104-2826

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Table of Contents

1	Introduction.....	1-1
1.1	Project Background.....	1-1
1.2	Purpose of Technical Report.....	1-3
1.3	Organization of Technical Report.....	1-3
2	Methodology and Assumptions.....	2-1
3	Relevant Plans, Policies, and coordination	3-1
3.1	Guiding Regulations, Plans, and/or Policies	3-1
3.2	Agency Coordination.....	3-2
3.2.1	NEPA Lead Agency.....	3-2
3.2.2	Cooperating and Participating Agencies.....	3-2
4	Affected Environment	4-1
4.1	Regional Context and Travel Patterns	4-1
4.1.1	Transportation Facilities.....	4-1
4.1.2	Travel Demand and Patterns.....	4-5
4.2	Transit	4-23
4.2.1	Transit Operations and Level of Service	4-23
4.2.2	Regional Transit.....	4-27
4.2.3	Local and Sub-Regional Transit.....	4-9
4.3	Freeway Operations	4-12
4.3.1	Evaluation Methodology.....	4-12
4.3.2	Freeway Volumes	4-15
4.3.3	Freeway Speeds and Level of Service.....	4-19
4.4	Arterials and Local Streets	4-23
4.4.1	Traffic Operations.....	4-23
4.4.2	Property Access and Local Circulation.....	4-37
4.5	Nonmotorized Facilities	4-44
4.5.1	Pedestrian Facilities	4-44
4.5.2	Bicycle Facilities.....	4-56
4.6	Freight Mobility and Access	4-67
4.6.1	Key Freight Roadways.....	4-67
4.7	Parking	4-72
4.7.1	Segment A: Seattle to Shoreline.....	4-73
4.7.2	Segment B: Shoreline to Mountlake Terrace.....	4-77

4.7.3	Segment C: Mountlake Terrace to Lynnwood.....	4-79
4.8	Safety	4-81
4.8.1	I-5 Ramps and Ramp Terminals	4-82
4.8.2	Local Intersections	4-84
5	Long-Term Impacts	5-1
5.1	Regional Context and Travel Patterns	5-1
5.1.1	Travel Demand and Patterns.....	5-1
5.2	Transit	5-4
5.2.1	Regional Transit.....	5-4
5.2.2	Local and Sub-Regional Bus Transit	5-27
5.3	Freeway Operations	5-34
5.3.1	Freeway Volumes	5-35
5.4	Arterials and Local Streets	5-51
5.4.1	Traffic Volume Forecasts.....	5-52
5.4.2	Traffic Operations.....	5-56
5.4.3	Property Access and Local Circulation.....	5-88
5.5	Nonmotorized Facilities	5-98
5.5.1	Pedestrian Facilities	5-99
5.5.2	Bicycle Facilities.....	5-114
5.6	Freight Mobility and Access	5-124
5.7	Parking	5-129
5.8	Safety	5-140
6	Construction Impacts	6-1
6.1	General Corridorwide Construction Effects.....	6-2
6.1.1	Truck Volumes and Haul Routes	6-3
6.2	Segment A: Seattle to Shoreline.....	6-4
6.2.1	Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations.....	6-10
6.2.2	Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations	6-14
6.2.3	Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations.....	6-16
6.2.4	Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations.....	6-16
6.2.5	Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations.....	6-19
6.2.6	Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations.....	6-19

6.2.7	Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations.....	6-20
6.3	Segment B: Shoreline to Mountlake Terrace	6-20
6.3.1	Preferred Alternative (B2 Modified): Mountlake Terrace Transit Center Station	6-24
6.3.2	Alternative B1: Mountlake Terrace Transit Center Station	6-25
6.3.3	Alternative B2A (Modified): Mountlake Terrace Transit Center Station with 220th Street SW Station North Option	6-26
	220th Street SW Station North (elevated)	6-26
6.3.4	Alternative B4: Mountlake Terrace Freeway Station	6-26
6.4	Segment C: Mountlake Terrace to Lynnwood.....	6-27
6.4.1	Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride Station.....	6-30
6.4.2	Alternative C1: 52nd Avenue West to 200th Street SW Station.....	6-32
6.4.3	Alternative C2: 52nd Avenue West to Lynnwood Transit Center	6-33
6.4.4	Alternative C3: 52nd Avenue West to Lynnwood Transit Center	6-34
7	Indirect Impacts	7-1
7.1	Regional Context and Travel Patterns	7-1
7.2	Transit	7-1
7.3	Freeway Operations	7-2
7.4	Arterials and Local Streets	7-2
7.5	Nonmotorized Facilities	7-2
7.6	Parking	7-2
7.7	Safety	7-3
8	Cumulative Impacts	8-1
8.1	Regional Context and Travel Patterns	8-1
8.2	Transit	8-2
8.3	Freeway Operations	8-2
8.4	Arterials and Local Streets	8-2
8.5	Nonmotorized Facilities	8-4
8.6	Parking	8-4
8.7	Safety	8-4
9	Potential Mitigation measures	9-1
9.1	Regional Travel	9-2
9.2	Transit	9-2
9.3	Freeway	9-3
9.4	Traffic Operations.....	9-3

9.5	Property Access and Local Circulation	9-8
9.6	Nonmotorized Facilities	9-9
9.7	Freight Mobility and Access	9-9
9.8	Parking	9-9
9.9	Safety	9-9
9.10	Construction.....	9-9
9.10.1	Transit	9-9
9.10.2	Freeway Operations	9-10
9.10.3	Arterials and Local Streets	9-11
9.10.4	Parking	9-12
9.10.5	Nonmotorized Facilities	9-12
9.10.6	Freight Mobility and Access	9-12
9.10.7	Cumulative Construction Impacts	9-12
10	References	10-1

List of Figures

Figure 1-1. Lynnwood Link Extension Vicinity Map.....	1-2
Figure 4-1. Lynnwood Link Extension Project Area	4-3
Figure 4-2. Analysis Screenlines	4-8
Figure 4-3. Example of WSDOT Traffic Conditions Map	4-10
Figure 4-4. Extreme Congestion Conditions, Northgate to Lynnwood	4-11
Figure 4-5. Travel-Time Reliability for the Everett-to-Seattle Commute	4-12
Figure 4-6. I-5 North—General Purpose Traffic Congestion (2006)	4-14
Figure 4-7. Frequency of Significant Congestion on I-5 North—General Purpose Lanes, 2006 Weekday Average	4-15
Figure 4-8. Estimated Average Weekday Travel Times (2006)—Seattle Central Business District to SR 526 Interchange: Northbound General Purpose Lanes (23.7 Miles)	4-16
Figure 4-9. Estimated Average Weekday Travel Times (2006)—SR 526 Interchange to Seattle Central Business District: Southbound General Purpose Lanes (23.7 Miles)	4-16
Figure 4-10. HOV Lane Performance Standard	4-18
Figure 4-11. Heavily Congested Segments (AM)	4-19
Figure 4-12. Heavily Congested Segments (PM)	4-20
Figure 4-13. Change in HOV Lane Speed and Reliability— I-5 Southbound, SR 526 to Northgate (16.6 Miles)	4-22
Figure 4-14. Change in HOV Lane Speed and Reliability— I-5 Northbound, Northgate to SR 526 (16.6 Miles)	4-22
Figure 4-15. Existing PM Peak Hour Service Frequency Level of Service.....	4-6
Figure 4-16. Existing Hours of Service Level of Service	4-7
Figure 4-17. Freeway Mainline and Ramp Volumes (Segment A)—Existing Conditions AM and PM Peak Hour	4-16
Figure 4-18. Freeway Mainline and Ramp Volumes (Segment B)—Existing Conditions AM and PM Peak Hour	4-17
Figure 4-19. Freeway Mainline and Ramp Volumes (Segment C)—Existing Conditions AM and PM Peak Hour	4-18
Figure 4-20. Freeway LOS and Speeds (Segment A)—Existing Conditions AM and PM Peak Hour	4-20
Figure 4-21. Freeway LOS and Speeds (Segment B)—Existing Conditions AM and PM Peak Hour	4-21
Figure 4-22. Freeway LOS and Speeds (Segment C)—Existing Conditions AM and PM Peak Hour	4-22
Figure 4-23. Analysis Intersections.....	4-25
Figure 4-24. Existing PM Peak Hour Intersection LOS—Segment A.....	4-30
Figure 4-25. Existing AM Peak Hour Intersection LOS—Segment A	4-31
Figure 4-26. Existing PM Peak Hour Arterial LOS—City of Shoreline Arterials	4-32
Figure 4-27. Existing PM Peak Hour Intersection LOS—Segments B and C.....	4-35

Figure 4-28. Existing AM Peak Hour Intersection LOS—Segments B and C	4-36
Figure 4-29. NE 130th Street Station Pedestrian Facility Inventory	4-49
Figure 4-30. NE 145th Street Station Pedestrian Facility Inventory	4-50
Figure 4-31. NE 155th Street Station Pedestrian Facility Inventory	4-51
Figure 4-32. NE 185th Street Station Pedestrian Facility Inventory	4-52
Figure 4-33. Mountlake Terrace Transit Center Station Pedestrian Facility Inventory	4-53
Figure 4-34. 220th Street SW Station Pedestrian Facility Inventory.....	4-54
Figure 4-35. Lynnwood Transit Center Station Pedestrian Facility Inventory.....	4-55
Figure 4-36. NE 130th Street Station Bicycle Facility Inventory	4-58
Figure 4-37. NE 145th Street Station Bicycle Facility Inventory	4-59
Figure 4-38. NE 155th Street Station Bicycle Facility Inventory	4-60
Figure 4-39. NE 185th Street Station Bicycle Facility Inventory	4-61
Figure 4-40. Mountlake Terrace Transit Center Station Bicycle Facility Inventory	4-63
Figure 4-41. 220th Street SW Station Bicycle Facility Inventory.....	4-64
Figure 4-42. Lynnwood Transit Center Station Bicycle Facility Inventory	4-66
Figure 4-43. FGTS and City Freight Route Classifications in Segment A.....	4-69
Figure 4-44. FGTS Classifications in Segments B and C.....	4-71
Figure 4-45. Areas Inventoried for Parking in Segment A.....	4-73
Figure 4-46. Area Inventoried for Segment B.....	4-77
Figure 4-47. Areas Inventoried for Segment C	4-79
Figure 4-48. Existing Collision Analysis Locations in Study Area	4-87
Figure 5-1. Example Calculation of Project Riders	5-8
Figure 5-2. 2035 Average Weekday Station Boardings	5-10
Figure 5-3. 15-minute Walkshed and Bicycleshed—NE 130th Street Station	5-11
Figure 5-4. 15-minute Walkshed and Bicycleshed—NE 145th Street Station.....	5-12
Figure 5-5. 15-minute Walkshed and Bicycleshed—NE 155th Street Station.....	5-13
Figure 5-6. 15-minute Walkshed and Bicycleshed—NE 185th Street Station.....	5-14
Figure 5-7. 15-minute Walkshed and Bicycleshed—Mountlake Terrace Transit Center and Mountlake Terrace Freeway Station.....	5-15
Figure 5-8. 15-minute Walkshed and Bicycleshed—220th Street SW Station	5-16
Figure 5-9. 15-minute Walkshed and Bicycleshed—Lynnwood Transit Center Station Alternatives.....	5-17
Figure 5-10. No Build Alternative LOS for Service Frequency in Forecast Year 2035.....	5-23
Figure 5-11. Preferred Alternative and Other Light Rail Alternatives LOS for Service Frequency in Forecast Year 2035	5-24
Figure 5-12. No Build Alternative LOS for Hours of Service in Forecast Year.....	5-25
Figure 5-13. Preferred Alternative and Other Light Rail Alternatives LOS for Hours of Service in Forecast Year 2035	5-26

Figure 5-14. 2035 (Segment A) Peak Hour Freeway Volumes	5-37
Figure 5-15. 2035 (Segment B) Peak Hour Freeway Volumes	5-38
Figure 5-16. 2035 (Segment C) Peak Hour Freeway Volumes	5-39
Figure 5-17. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment A)	5-40
Figure 5-18. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment B)	5-41
Figure 5-19. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment C)	5-42
Figure 5-20. Segment A Seattle to Shoreline 2035 PM Peak Hour Intersection LOS.....	5-57
Figure 5-21. Segment A Seattle to Shoreline 2035 AM Peak Hour Intersection LOS	5-58
Figure 5-22. Segments B and C Shoreline to Lynnwood 2035 PM Peak Hour Intersection LOS.....	5-59
Figure 5-23. Segments B and C Shoreline to Lynnwood 2035 AM Peak Hour Intersection LOS.....	5-60
Figure 5-24. Forecast Year 2035 PM Peak Arterial LOS for the No Build Alternative—City of Shoreline Arterials	5-71
Figure 5-25. City of Shoreline Arterials Worsened by the Light Rail Alternatives	5-71

List of Tables

Table 4-1.	Daily VMT and VHT in the Puget Sound Region for Base Year 2011	4-6
Table 4-2.	Person Throughput—PM Peak Period.....	4-9
Table 4-3.	Service Frequency LOS Thresholds	4-25
Table 4-4.	Hours of Service LOS Thresholds	4-25
Table 4-5.	Passenger Load LOS Thresholds.....	4-26
Table 4-6.	Reliability of Service LOS Thresholds	4-27
Table 4-7.	Existing Bus Routes Evaluated in the Project Area.....	4-28
Table 4-8.	Existing Transit Facilities in the Project Area.....	4-1
Table 4-9.	Daily Bus Ridership on Selected Regional Corridors —Base Year (2011)	4-2
Table 4-10.	Transit Travel Times—AM Peak Period Southbound (minutes)	4-3
Table 4-11.	Transit Travel Times—PM Peak Period Northbound (minutes)	4-3
Table 4-12.	Transit Travel Times—PM Peak Period Southbound (minutes).....	4-4
Table 4-13.	Transit Transfer Rate	4-5
Table 4-14.	PM Peak Period Load Factors	4-8
Table 4-15.	AM and PM Peak Period Load Factors—King County Metro Routes, I-5 at NE Northgate Way.....	4-8
Table 4-16.	On-Time Performance—Sound Transit Regional Express Routes.....	4-9
Table 4-17.	Level of Service Definitions for Signalized and Unsignalized Intersections	4-26
Table 4-18.	Arterials and Local Street Performance Standards in the Project Corridor	4-26
Table 4-19.	Segment A Existing Roadway Facilities	4-27
Table 4-20.	Segment B Existing Roadway Facilities	4-33
Table 4-21.	Segment C Existing Roadway Facilities	4-34
Table 4-22.	Freight and Goods Transportation System Classifications.....	4-67
Table 4-23.	Parking Supply and Utilization for Segment A	4-74
Table 4-24.	Parking Supply and Utilization for NE 130th Street/I-5 Area	4-74
Table 4-25.	Parking Supply and Utilization for NE 145th Street/I-5 Area	4-75
Table 4-26.	Parking Supply and Utilization for NE 155th Street/I-5 Area	4-76
Table 4-27.	Parking Supply and Utilization for NE 185th Street/I-5 Area	4-76
Table 4-28.	Parking Supply and Utilization for the Mountlake Terrace Transit Center Area	4-77
Table 4-29.	Parking Supply and Utilization for the Mountlake Terrace Freeway Station Area.....	4-78
Table 4-30.	Parking Supply and Utilization for 220th Street SW/I-5 Area.....	4-78
Table 4-31.	Parking Supply and Utilization for Segment C	4-79

Table 4-32.	Parking Supply and Utilization for Lynnwood Park-and-Ride Station	4-80
Table 4-33.	Parking Supply and Utilization for Lynnwood Transit Center Station	4-80
Table 4-34.	Parking Supply and Utilization for 200th Street SW Station	4-81
Table 4-35.	I-5 Ramp Accident Data	4-82
Table 4-36.	Segment A, City of Seattle Intersection Accident Data.....	4-85
Table 4-37.	Segment A, City of Shoreline Intersection Accident Data.....	4-86
Table 4-38.	Segment B, City of Mountlake Terrace Intersection Accident Data.....	4-91
Table 4-39.	Segment C, City of Lynnwood Intersection Accident Data	4-92
Table 5-1.	Daily Vehicle Miles of Travel and Vehicle Hours of Travel for Forecast Year 2035.....	5-2
Table 5-2.	AM Peak Hour Screenline Vehicle Volumes for Forecast Year 2035.....	5-2
Table 5-3.	AM Peak Hour Screenline Volume-to-Capacity Ratios for Forecast Year 2035	5-2
Table 5-4.	PM Peak Hour Screenline Vehicle Volumes for Forecast Year 2035	5-3
Table 5-5.	PM Peak Hour Screenline Volume-to-Capacity Ratios for Forecast Year 2035	5-3
Table 5-6.	Daily Screenline Vehicle Volumes for Forecast Year 2035	5-3
Table 5-7.	Person Throughput—Forecast Year 2035 PM Peak Period	5-4
Table 5-8.	Assumed Feeder Bus Service to Light Rail Stations	5-6
Table 5-9.	Daily Ridership for Forecast Year 2035.....	5-7
Table 5-10.	Walkshed and Bicycleshed Population and Employment for Forecast Year 2035.....	5-18
Table 5-11.	2035 Transit Travel Times (minutes) from Shoreline for AM Peak Period Southbound.....	5-19
Table 5-12.	2035 Transit Travel Times (minutes) from Lynnwood for AM Peak Period Southbound	5-19
Table 5-13.	2035 Transit Travel Times (minutes) to Shoreline for PM Peak Period Northbound	5-20
Table 5-14.	2035 Transit Travel Times (minutes) to Lynnwood for PM Peak Period Northbound	5-20
Table 5-15.	2035 Transit Travel Times (minutes) from Shoreline for PM Peak Period Southbound.....	5-21
Table 5-16.	2035 Transit Travel Times (minutes) from Lynnwood for PM Peak Period Southbound	5-21
Table 5-17.	Transit Transfer Rates for the Base Year (2011) and Forecast Year (2035).....	5-23
Table 5-18.	PM Peak Hour Passenger Load Factors in Forecast Year 2035	5-27

Table 5-19.	Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment A)	5-43
Table 5-20.	Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment A)	5-45
Table 5-21.	Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment B).....	5-47
Table 5-22.	Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment B).....	5-47
Table 5-23.	Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment C).....	5-48
Table 5-24.	Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment C)	5-48
Table 5-25.	Existing and Proposed Park-and-Ride Capacity	5-55
Table 5-26.	Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A	5-62
Table 5-27.	Forecast Year 2035 AM Peak Hour Intersection LOS—Segment A.....	5-68
Table 5-28.	Forecast Year 2035 PM Peak Hour Intersection LOS—Segment B	5-80
Table 5-29.	Forecast Year 2035 AM Peak Hour Intersection LOS—Segment B.....	5-82
Table 5-30.	Forecast Year 2035 PM Peak Hour Intersection LOS—Segment C	5-85
Table 5-31.	Forecast Year 2035 AM Peak Hour Intersection LOS—Segment C.....	5-86
Table 5-32.	2035 Estimated Pedestrian Trips per Train at Stations—PM Peak Hour Light Rail Alighting to Mode Transfer.....	5-100
Table 5-33.	2035 Estimated Pedestrian Trips per Train at Stations—PM Peak Hour Light Rail Boarding from Mode of Access.....	5-100
Table 5-34.	Segment A Parking Impacts	5-130
Table 5-35.	Segment A Park-and-Ride Impacts and Proposed New Parking Spaces.....	5-131
Table 5-36.	Segment B Parking Impacts.....	5-136
Table 5-37.	Segment B Park-and-Ride Impacts and Proposed New Parking Spaces	5-136
Table 5-38.	Segment C Parking Impacts.....	5-138
Table 5-39.	Segment C Park-and-Ride Impacts and Proposed New Parking Spaces	5-139
Table 6-1.	Segment A: Roadway Closures and Duration.....	6-6
Table 6-2.	Segment B: Roadway Closures and Duration	6-21
Table 6-3.	Segment C: Roadway Closures and Duration	6-27
Table 9-1.	Forecast Year 2035 PM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment A	9-4
Table 9-2.	Forecast Year 2035 AM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment A	9-6
Table 9-3.	Forecast Year 2035 PM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment C.....	9-7
Table 9-4.	Forecast Year 2035 AM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment C.....	9-8

List of Appendices

Appendix A: Transportation Technical Analysis Methodology

Appendix B: Future Transportation Improvement Assumptions for the No Build Alternative

Appendix C: Detailed LOS Analysis Reports

Appendix D: I-5 Collision Data

Acronyms and Abbreviations

acc/MEV	accidents per million entering vehicles
ADA	Americans with Disabilities Act
BNSF	Burlington Northern Santa Fe
CCTV	closed-circuit television
CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
FGTS	Washington State Freight and Goods Transportation System
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
CAL	collision analysis location
HOV	high-occupancy vehicle
HSS	Highways of Statewide Significance
I-405	Interstate 405
I-5	Interstate 5
LOS	level of service
mph	miles per hour
NEPA	National Environmental Policy Act
PSRC	Puget Sound Regional Council
PUD	Public Utility District
RCW	Revised Code of Washington
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
Sea-Tac Airport	Seattle-Tacoma International Airport
SEPA	State Environmental Policy Act
Sound Transit	Central Puget Sound Regional Transit Authority
SR	State Route
ST2	Sound Transit 2
TCQSM	Transit Capacity and Quality of Service Manual
TCRP	Transit Cooperative Research Program
USC	United States Code
v/c ratio	volume-to-capacity ratio
VHT	vehicle hours of travel
VMT	vehicle miles of travel
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

1.1 Project Background

The Central Puget Sound Regional Transit Authority (Sound Transit) intends to extend the Link light rail system from the planned station at the Northgate Transit Center in Seattle to the Lynnwood Transit Center in Lynnwood in southern Snohomish County, as shown in Figure 1-1. This project is currently known as the Lynnwood Link Extension. As part of the federal regulations and guidelines leading to the application for New Starts grant funds, Sound Transit conducted an Alternatives Analysis (Sound Transit 2011a) to support the evaluation of several options for addressing mobility needs in the project corridor. Sound Transit is conducting analysis and preparing a National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA) Final Environmental Impact Statement (EIS) for the project.

The project corridor generally follows Interstate 5 (I-5) between Northgate and Lynnwood. While it is the major north-south route through the state of Washington, I-5 also serves a large commuter market between Snohomish and King counties and the city of Seattle. The corridor falls within an urban area that is constrained by Puget Sound to the west and Lake Washington to the east. There is a large north-to-south commuter market in this area that travels between the communities in Snohomish and King counties, toward Seattle or north to Everett, where many of the region's jobs are located.

The Lynnwood Link Extension is an element of Sound Transit's adopted Long-Range Plan and is part of the Sound Transit 2 (ST2) Plan for regional transit investments approved by voters in 2008. The project is also in the region's Metropolitan Transportation Plan (Puget Sound Regional Council's *Transportation 2040*). All of these plans anticipate the eventual extension of mass transit service north to Everett, and connecting to a regional system of rail and bus service serving other markets to the south, such as the University of Washington, Capitol Hill, downtown Seattle, downtown Bellevue, Redmond, SeaTac, and Federal Way.

The Final EIS phase for the Lynnwood Link Extension is building on the results of the Alternatives Analysis that Sound Transit performed in 2010 and 2011, and the findings from the Draft EIS in 2012 and 2013. The Alternatives Analysis developed and evaluated a range of alternatives to improve transit in the corridor, and resulted in an *Alternatives Analysis Report and SEPA Addendum* that identified the most promising alternatives for more detailed study and analysis (Sound Transit 2011a). From September 30, 2011, to October 31, 2011, Sound Transit and the Federal Transit Administration (FTA) conducted public scoping for the EIS. Based on the results of the scoping process, in December 2011 the Sound Transit Board of Directors determined that the alternatives to be further developed and studied in the

EIS would be limited to light rail, and the general alignment would be along I-5 (Sound Transit 2011b). For the I-5 corridor alternative concepts, the Draft EIS evaluated a range of potential alternatives in three segments from Northgate to Lynnwood. Sound Transit and FTA published a Draft EIS for the project on July 26, 2013, with a 60-day comment period that ended on September 23, 2013. After the end of the comment period, which included four open house events with public hearings, Sound Transit reviewed the public comments. The Sound Transit Board then reviewed the alternatives, the Draft EIS and the public comments before approving Motion M2013-96, identifying a Preferred Alternative for the Final EIS. Motion M2013-96 also directed Sound Transit to further evaluate potential modifications and options for the Preferred Alternative and other alternatives.



Figure 1-1. Lynnwood Link Extension Vicinity Map

1.2 Purpose of Technical Report

This technical report presents detailed findings from the technical analysis of potential transportation impacts of the Lynnwood Link Extension. A summary of the information in this report is provided in Chapter 3, Transportation Impacts and Mitigation, of the Lynnwood Link Extension Final EIS.

1.3 Organization of Technical Report

In addition to this Chapter 1, Introduction, the report comprises the following chapters:

- Chapter 2, Methodology and Assumptions, summarizes the analysis methods used to assess the alternatives in this report.
- Chapter 3, Relevant Plans, Policies, and Coordination, provides information regarding guiding regulations, plans, and policies and agency participation in the planning and analysis process.
- Chapter 4, Affected Environment, discusses current transportation conditions.
- Chapter 5, Long-Term Impacts, describes anticipated impacts in terms of the following:
 - Regional Context and Travel Patterns
 - Transit
 - Freeway Operations
 - Arterials and Local Streets
 - Nonmotorized Facilities
 - Freight Mobility and Access
 - Parking
 - Safety
- Chapter 6, Construction Impacts, discusses expected impacts due to project construction activities.
- Chapter 7, Indirect and Secondary Impacts, describes the project effects that may occur later in time or some distance from the project.
- Chapter 8, Cumulative Impacts, describes the potential additional cumulative transportation effects of other projects that were not included in the traffic and ridership modeling.
- Chapter 9, Potential Mitigation Measures, describes the potential measures that could be implemented to mitigate effects of the project.

2 METHODOLOGY AND ASSUMPTIONS

The methodology and assumptions used to analyze the transportation impacts of the Lynnwood Link Extension are presented in detail in the *Transportation Technical Analysis Methodology Memorandum* (Sound Transit 2012), and subsequently refined in the *Transportation Technical Analysis Methodology Addendum* for the Final EIS (Sound Transit 2014) to reflect comments made on the Draft EIS analysis. Both of these documents are provided in Appendix A of this technical report. These documents provide the following information.

- Guiding regulations, plans, and/or policies that guide the transportation analysis
- A list of lead and cooperating agencies
- Data needs and sources, such as traffic volumes, parking supply and utilization, pedestrian and bicycle facilities, accident data, and transit service characteristics
- Study area and area of effect, including intersections and roadway segments studied
- Analysis tools used for travel demand forecasting and traffic operations analysis
- Assessment methods and analysis thresholds used for analysis of regional transit, regional traffic, corridor traffic, local and sub-regional bus service, intersection operations, freeway and ramp operations, property access and local circulation, parking, nonmotorized facilities and modes, freight, construction, and safety
- Methodology for development of detailed traffic volumes
- Assessment methods for indirect and cumulative effects
- Transportation data developed for use by other disciplines
- Development of mitigation measures

3 RELEVANT PLANS, POLICIES, AND COORDINATION

3.1 Guiding Regulations, Plans, and/or Policies

The transportation analysis is guided by the following laws and regulations:

- NEPA
- SEPA
- Moving Ahead for Progress in the 21st Century Act (MAP-21), Public Law 112-141
- Code of Federal Regulations (CFR) 23 Part 450 (implementing United States Code [USC] 23 Section 111, which requires the U.S. Secretary of Transportation to approve access revisions to the Interstate System)
- CFR 23 Part 625 (Design Standards for Highways)
- CFR 23 Part 710 (Right-Of-Way and Real Estate)
- CFR 23 Part 771 (Environmental Impact and Related Procedures)
- CFR 23 Part 810 (Mass Transit and Special Use Highway Projects)
- Washington State Growth Management Act (Revised Code of Washington [RCW] 36,70A.070)
- In addition to the laws and regulations identified above, the analysis of local transportation impacts is guided by the policy direction established in the numerous plans or policy documents adopted within the project corridor. These include, but are not limited to:
 - ST2 Plan, approved November 4, 2008
 - Transit-Oriented Development (TOD) Program Strategic Plan Update (Sound Transit, April 24, 2014)
 - Strategic Plan for Public Transportation 2011–2021 (King County Department of Transportation Metro Transit Division, July 11, 2011)
 - 2014–2019 Transit Development Plan (Community Transit, May 1, 2014 Final)
 - Community Transit Long-Range Transit Plan (Community Transit, February 4, 2011)
 - Washington Transportation Plan 2007–2026 (Washington State Department of Transportation [WSDOT], November 14, 2006)
 - WSDOT Design Manual (M.3082.02) (January, 2014)
 - WSDOT Development Service Manual (M.3007.00) (September, 2005)

- Puget Sound Regional Council (PSRC) Transportation 2040-Update Report: Toward a Sustainable Transportation System (Spring 2014)
- PSRC Transit Supportive Toolkit (December 2013)
- Comprehensive and/or Transportation Plans for the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood, as well as King County and Snohomish County
- 6-Year Capital Improvement Program for the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood, as well as King County and Snohomish County

3.2 Agency Coordination

The transportation planning and analysis process has involved local jurisdictions, state agencies, federal agencies, transit agencies, PSRC, and other interested parties.

3.2.1 NEPA Lead Agency

The FTA is the lead agency for development of the Final EIS in accordance with NEPA regulations.

3.2.2 Cooperating and Participating Agencies

For the development of the Final EIS and this Transportation Technical Report, Sound Transit staff and consultants met with and/or coordinated with staff planners and engineers from the following cooperating and participating agencies:

- WSDOT
- Federal Highway Administration (FHWA)
- PSRC
- Community Transit
- King County Metro
- City of Lynnwood
- City of Mountlake Terrace
- City of Shoreline
- City of Seattle
- Snohomish County
- King County

4 AFFECTED ENVIRONMENT

4.1 Regional Context and Travel Patterns

This section discusses the primary roadways in the project area and their current use.

Key observations and findings include the following:

- Peak direction traffic volumes across north-south screenlines in the corridor currently approach overall capacity.
- Approximately 115,000 persons travel through the corridor by transit and automobiles at Northgate during the 3-hour PM peak period¹, including travel on I-5 and adjacent arterials.
- Traffic congestion on I-5 currently adds 44 minutes of travel time to the general purpose lanes and 38 minutes to the high-occupancy vehicle (HOV) lanes for a trip from Everett to Seattle during the AM peak period. During the PM peak period, traffic congestion adds 23 minutes for the general purpose lanes and 21 minutes for the HOV lanes.
- The general purpose lanes on I-5 operate at over capacity during multiple hours of the day. The HOV lane is also congested, although not to the level of the general purpose lanes.
- The HOV lanes on I-5 are currently not meeting WSDOT's adopted performance standard (maintaining an average speed of 45 miles per hour [mph] or more at least 90 percent of the time during the peak hour² in both the morning and afternoon).³
- The majority of riders using the Lynnwood Link Extension to travel between downtown Seattle and the University District would begin their trips in north Seattle, North Creek, Shoreline, Edmonds, and Lynnwood.

In summary, the I-5 corridor, which is the predominant travel corridor connecting urban centers, including Lynnwood, Northgate, and downtown Seattle, has limited person throughput and reliability for automobile and transit users due to traffic congestion in both the general purpose and HOV lanes.

4.1.1 Transportation Facilities

The project area is served by a network of roadways consisting of a major interstate route (I-5), state highways (SR 99, SR 523, SR 522, and SR 104), and other local arterials and roads as shown in Figure 4-1.

¹ PM peak period is defined as the three consecutive hours with the highest traffic or transit volumes during afternoon/evening. For the purpose of the Sound Transit Ridership and Highway Models, this is approximately 3-6pm.

² Peak hour is defined as the single hour with the highest traffic or transit volumes during the PM peak period.

³ <http://wsdot.wa.gov/publications/fulltext/graynotebook/CR12.pdf>

Major Limited-Access Highways

The primary north-south highway through the project area is I-5, a limited access freeway, facilitating regional and interstate movement, regional express bus service, and access to jurisdictions within the corridor. It is an essential roadway for the movement of people and goods in the Puget Sound region and is at or near capacity during many hours of the day. A number of traffic management features are incorporated in this highway facility, including HOV lanes, ramp meters, queue bypass lanes, and variable message signs to provide information to drivers. WSDOT operates a roadway conditions service Web site for I-5 and other facilities in Puget Sound that links to mobile devices and provide roadway congestion information.

State Highways and Local Arterials

Several of the north-south arterials offering connections among neighborhoods, commercial districts, major access points to I-5, and major destinations include Aurora Avenue North (SR 99), Meridian Avenue North, 5th Avenue NE, 15th Avenue NE, 52nd Avenue West, and segments of Roosevelt Way North.

Four state highways located within the project area provide access to bus transit, passenger rail, and the movement of freight through the area.

SR 99 (Aurora Avenue North) is a primary north-south roadway that is parallel to I-5 through the project area. It is an important arterial with high traffic volumes, five to seven travel lanes, a high degree of access control, and traffic signal coordination that facilitates north-south travel flows. Portions of this roadway have managed access, which improves the roadway capacity by limiting left-turn movements at midblock locations into businesses and local streets. SR 99 also serves as a major facility for transit with business access and transit lanes (lanes that are restricted to buses and vehicles accessing businesses) accommodating bus rapid transit services through much of the project area as well as other express and local bus services. Arterial improvements are under construction in Shoreline to implement additional business access and transit lanes plus managed access.

SR 523, also known as North/NE 145th Street, is a four-lane arterial that provides access to I-5 as well as Lake City Way to the east and SR 99 to the west. North/NE 145th Street is an arterial that connects communities, forms the city boundary between Seattle and Shoreline, and passes through residential development.

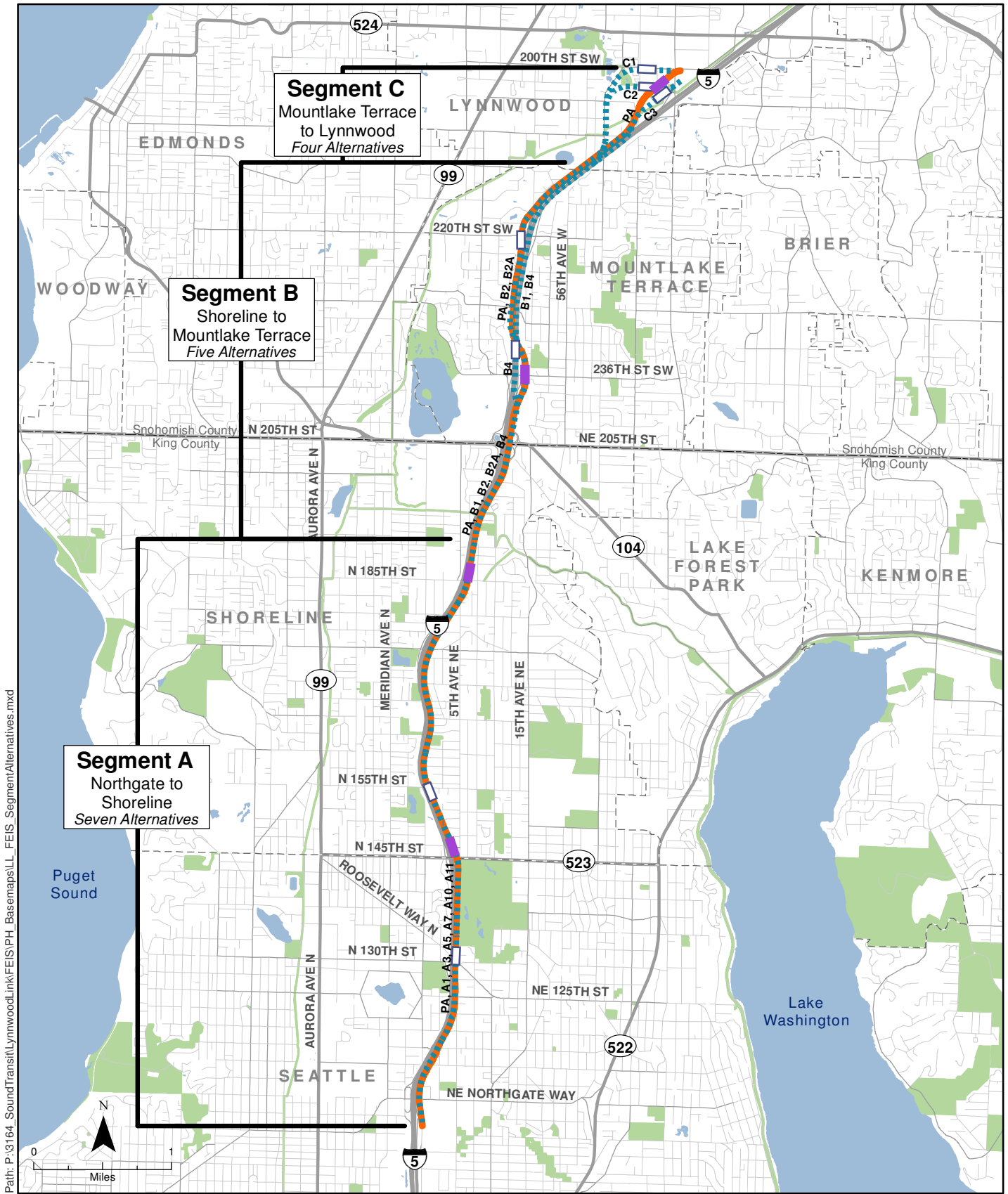


Figure 4-1
Alternatives by Segment

Lynnwood Link Extension

SR 104 extends from SR 522 to the Edmonds Ferry Terminal where SR 104 crosses Puget Sound via the Washington State Ferries. In the project area, SR 104 is named differently depending on the jurisdiction in which it is located. From east to west, it is known as Ballinger Way, 244th Street SW, NE 205th Street (the King-Snohomish county line), and Edmonds Way as it approaches the Edmonds Ferry Terminal. SR 104 is a two-to-four-lane arterial that runs northwest-southeast and provides access to I-5. Peak-period congestion along SR 104 is recurring within the SR 104/I-5 interchange area, extending east along Ballinger Way and west along the SR 99/Aurora Village commercial district.

SR 524, also known as 196th Street, is a major east-west arterial through Lynnwood. In the west, it connects to SR 99 and Edmonds. To the east, SR 524 continues under Interstate 405 (I-405) with no access to the interstate and ends at SR 522.

East-west arterial travel within the project area is tied to connections with I-5, to Aurora Avenue North/SR 99, and to Lake City Way/SR 522. A limited number of north-south arterials provide connectivity among neighborhoods, commercial districts, and communities, both east and west of I-5.

NE 130th Street, NE 145th Street, and NE 175th Street are four-lane arterials that access I-5 with interchanges, where congestion occurs regularly. North 117th Street, NE 155th Street, and NE 185th Street cross I-5 and connect business districts on each side of I-5. Peak-period travel conditions on east-west routes are a function of arterial spacing, access to I-5, and proximity to commercial districts. East-west traffic flows generally at arterial speeds between 30 and 35 mph.

Other major north-south roadways in the project area include Meridian Avenue North/76th Avenue West, 15th Avenue NE, 5th Avenue NE, Greenwood Avenue North, Westminster Way North, and SR 522. These arterials provide additional capacity for commuters during peak travel periods as well as access to residential neighborhoods.

Meridian Avenue North is a two-lane minor arterial (30 mph) that provides both property access and neighborhood connections among the single-family residential neighborhoods north of North 130th Street. This roadway extends across the county boundary, continuing as 76th Avenue West in Snohomish County and connecting to SR 99/Pacific Highway. Meridian Avenue North carries between 6,100 and 12,000 vehicles per day within Shoreline⁴. Meridian Avenue North/76th Avenue West has limited intersection control, with signals at major east-west arterials; otherwise, it serves as a direct north-south route between I-5 and SR 99.

⁴ City of Shoreline Traffic Flow Map, December 2009

15th Avenue NE is a two- to five-lane arterial that extends north from Northgate Way to SR 104/Ballinger Way east of I-5. It carries between 9,100 and 16,600 vehicles per day⁵ and the speed limit is 25 to 35 mph. This major arterial passes through the Northgate commercial district as well as a historical Shoreline business district. This route provides neighborhood and community connections, a commuter bypass to I-5, and links to residential areas.

5th Avenue NE, which is a remnant collector arterial from the I-5 construction, lies immediately adjacent to I-5 between NE 130th Street and NE 185th Street. It is a two-lane street that provides access to single-family residential neighborhoods and neighborhood commercial districts in Shoreline. The speed limit is 30 mph, and traffic volumes are modest within Shoreline at 3,300 to 6,900 vehicles per day⁶. 5th Avenue NE is likely used as a bypass to I-5 during peak-period congestion.

Roosevelt Way North/NE is another remnant of I-5 construction with a segment west of I-5 that connects North 130th Street to Aurora Avenue North and North 145th Street, running northwest to southeast. It is a two-lane, tree-lined street with an open ditch that serves adjacent single-family residential neighborhoods as a low-speed and low-volume collector street. Roosevelt Way extends to the east of I-5 from the North 130th Street interchange and connects to SR 522/Lake City Way via NE 125th Street.

Within Lynnwood, 200th Street SW provides a three-lane minor arterial connection between SR 99 and the Lynnwood Transit Center. With a posted speed limit at 30 mph, traffic along 200th Street SW flows smoothly through multifamily residential neighborhoods.

4.1.2 Travel Demand and Patterns

Miles Driven and Hours Spent in Travel

Table 4-1 shows the vehicle miles of travel (VMT) and vehicle hours of travel (VHT) for the Puget Sound region as modeled with the PSRC Regional Model: WSDOT Project Version for 2011, which is used as the base year. Detailed information about that model is provided in the *Transit Ridership Forecasting Technical Report* (Sound Transit 2012). These systemwide measures are useful primarily for comparison purposes. They will be used to compare to future conditions with and without the Lynnwood Link Extension to indicate travel growth in the region and the effect of the project on that growth.

⁵ Ibid.

⁶ Ibid.

Table 4-1. Daily VMT and VHT in the Puget Sound Region for Base Year 2011

	VMT	VHT
Base Year (2011)	79,440,000	2,210,000

Vehicles Traveling through the Corridor

Figure 4-2 presents the four screenlines that were used for analyzing corridor traffic conditions along with current AM peak hour, PM peak hour, and daily traffic volumes across those screenlines by direction, including directional volume-to-capacity (v/c) ratios for the peak hours.

A “screenline” is an imaginary line across a section of freeway and/or arterials. Screenlines are often used in traffic analyses to determine how much volume is entering or exiting a particular area based on how much traffic crosses the screenline. A v/c ratio above 0.90 (or 90 percent of capacity) typically represents congested conditions. A v/c ratio of 1.0 indicates that a corridor is operating at capacity and represents highly congested conditions.

The four screenlines used in this analysis were selected by Sound Transit in consultation with local agencies to represent locations within the corridor where major movements might be affected by the project. The v/c ratios are an indicator of a given facility to accommodate the demand wanting to use it, and as such, provide a general assessment of congestion levels. The traffic volumes and v/c ratios shown were also derived from the PSRC Regional Model: WSDOT Project Version for the base year (2011) scenario.

During the AM peak hour, in the southbound peak direction of traffic flow, traffic volumes approach the overall capacity at screenlines 1, 2, and 3, indicating that AM peak hour travel in the peak direction through the corridor is currently congested. However, these three screenlines are well below capacity in the reverse direction, with a v/c ratio of around 0.40. Screenline 4, on NE 145th Street just east of I-5, has a v/c ratio of 0.71 in the westbound direction (the peak flow of travel) indicating relatively high volumes, but within the capacity of the facility. At a v/c ratio of 0.25 in the eastbound direction, traffic flows are well within the capacity of the roadway.

Similar to the AM peak hour, during the PM peak hour, the screenlines show traffic volumes approaching or at the overall capacity of screenlines in the northbound direction, which is the peak direction of traffic flow. Southbound traffic volumes during the PM peak hour also reflect congested conditions.

These screenlines are below capacity in the reverse direction, at a v/c ratio of 0.63; however, southbound travel is still typically difficult in the PM peak hour due to a combination of bottleneck locations, particularly in the Northgate area near the terminus of the reversible I-5 express lanes, and congestions emanating from multiple points as far south as downtown Seattle. In the Northgate area, in the PM peak hour

(when the express lanes are northbound) the southbound HOV lane traffic is forced to merge into the southbound general purpose lanes at this location. Additionally, immediately south of this point, traffic from the Northgate interchange merges into the mainline, and then a southbound lane drops to NE 80th/85th Streets, resulting in only a three-lane southbound mainline. This constraint builds upon the southbound congestion that emanates from farther south and causes southbound congestion that backs up to north of Northgate on a regular basis in the PM peak period. Additionally, because the southbound HOV lane terminates at this point, current southbound express bus service cannot bypass the freeway congestion, resulting in very unreliable southbound transit travel times, as well as significant delay for buses returning to terminals or bases at the end of service or to start a route.

Screenline 4 has a v/c ratio of about 0.60 in both directions during the PM peak hour, generally indicating acceptable levels of service.

On a daily basis, screenline traffic volumes are fairly well balanced, with slightly higher traffic volumes in the southbound direction on screenlines 1 through 3 and higher volumes in the westbound direction on screenline 4.

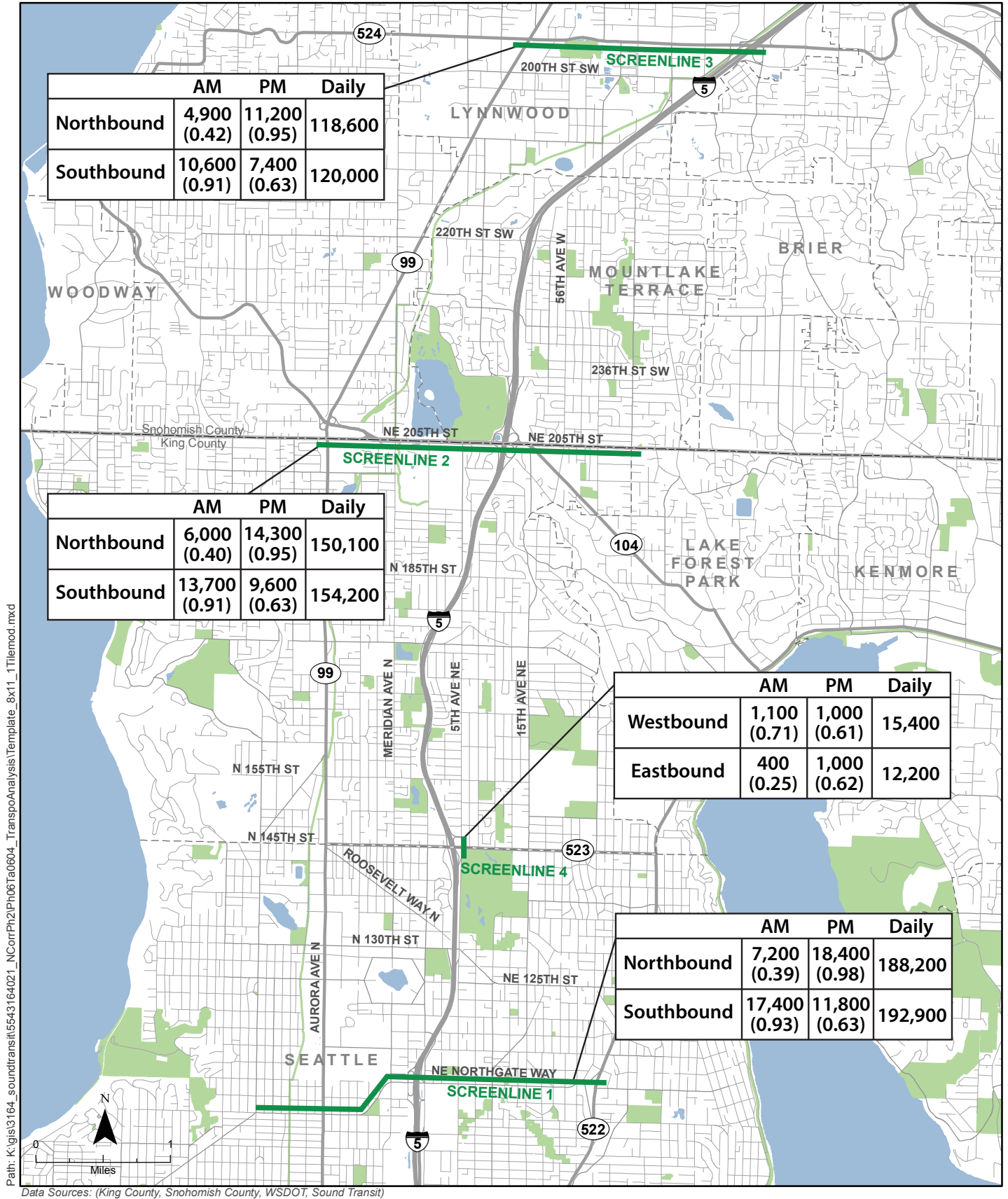


Figure 4-2
Analysis Screenlines
Lynnwood Link Extension

People Traveling through the Corridor

Table 4-2 shows existing person throughput during the PM peak period in the corridor at two screenline locations. The person throughput includes trips on I-5, SR 99, and other north-south arterials via both automobile and transit.

Approximately 115,000 persons travel through the corridor at Northgate during the 3-hour PM peak period. Similar to the VMT and VHT measures, this measure is most useful for comparison purposes. It is used to compare to future conditions with and without the Lynnwood Link Extension to indicate the expected trip growth within the corridor, and the effect of the project on that growth.

Table 4-2. Person Throughput—PM Peak Period

Screenline	Screenline Location	Northbound	Southbound	Total
1	North of Northgate Way NE			
	Transit	11,000	2,000	13,000
	Automobile	62,000	40,000	102,000
	Total	73,000	42,000	115,000
2	South of North 205th Street			
	Transit	7,000	1,000	8,000
	Automobile	49,000	32,000	81,000
	Total	56,000	33,000	89,000

Sources: Sound Transit Ridership Model and PSRC Regional Model: WSDOT Project Version (2012)

I-5 Congestion

WSDOT reports and records traffic conditions for major roadway facilities on a daily basis. The segment of I-5 between Everett (at the SR 526 interchange) and downtown Seattle carries some of the highest vehicle volumes in the region. Figure 4-3, the WSDOT traffic conditions map, characterizes traffic conditions from “stop and go” to “wide open” conditions. A typical November weekday is shown in this figure; however, a wide variation of peak period congestion is experienced throughout the corridor. A recent study of I-5 operations by WSDOT⁷ found that, although the recent recession has caused a decrease in traffic volumes, traffic congestion continues to be an issue in the corridor. Figure 4-4 summarizes data collected in 2011, indicating that areas of extreme congestion continue to occur in the corridor throughout much of the AM and PM peak periods.

⁷ WSDOT, Puget Sound Express Toll Lanes Concept Study, July 2014

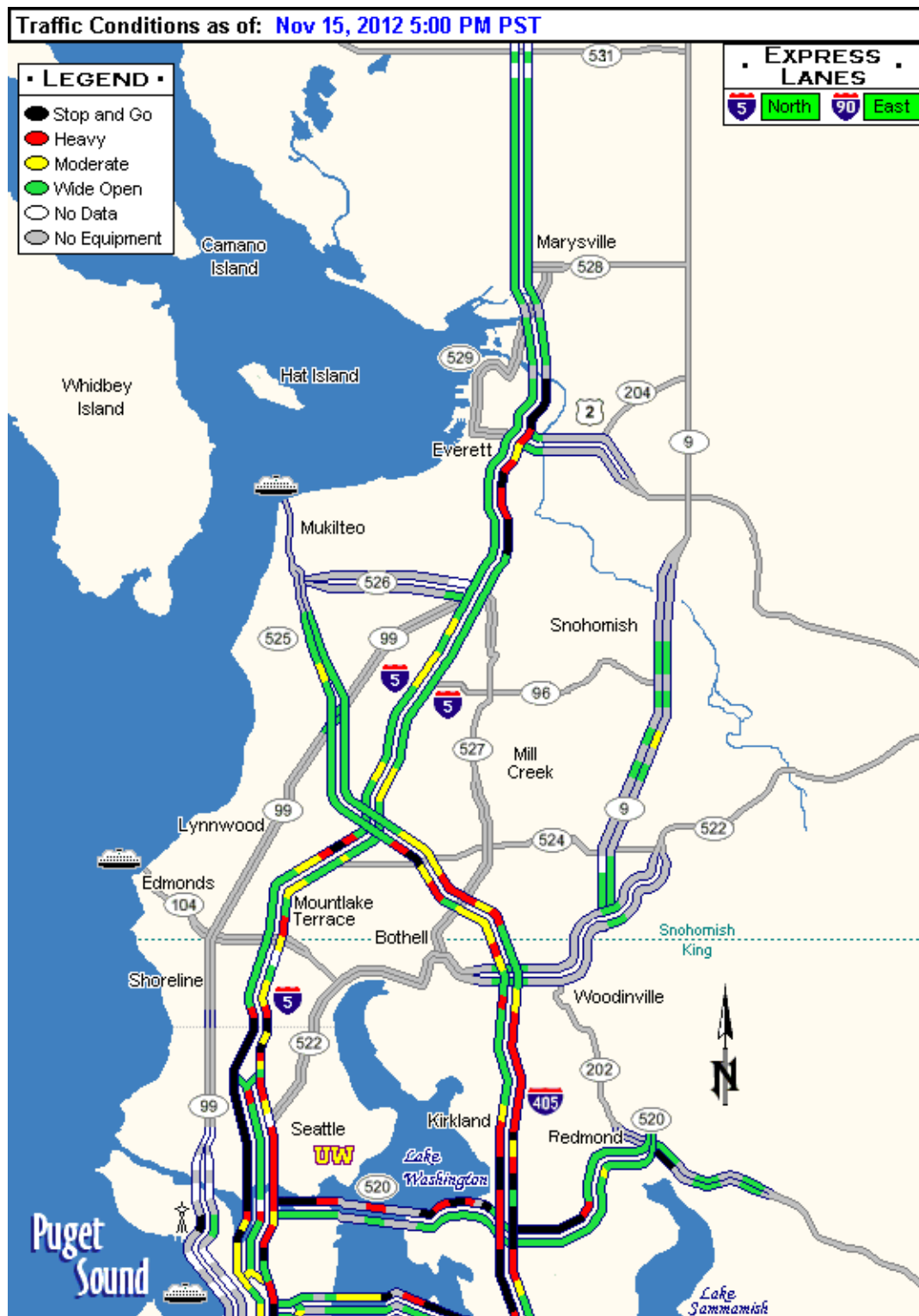


Figure 4-3. Example of WSDOT Traffic Conditions Map

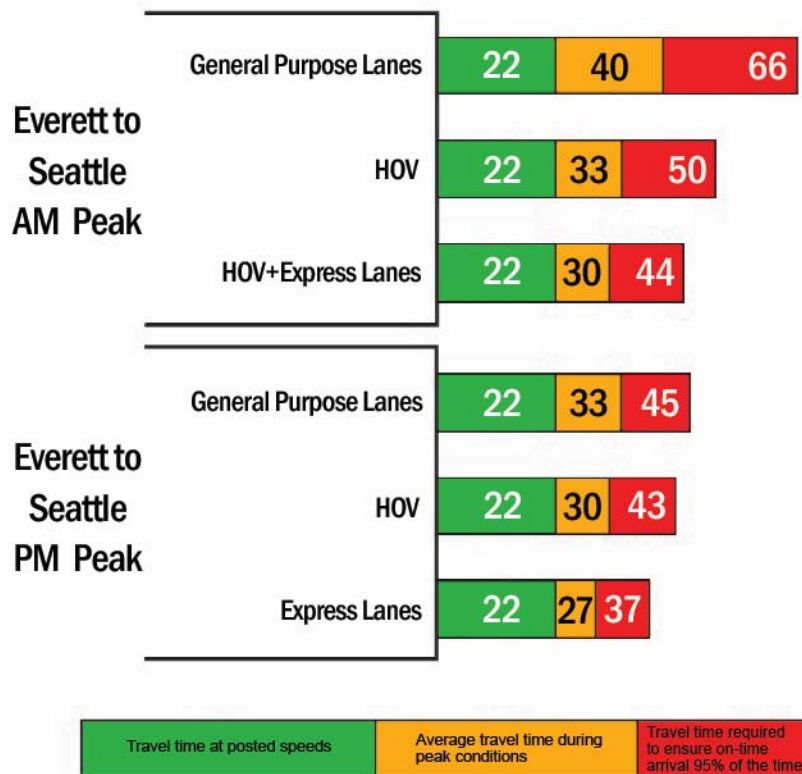


Source: WSDOT Congestion Data, 2011

Figure 4-4. Extreme Congestion Conditions, Northgate to Lynnwood

Roadway congestion is often reported in terms of travel-time reliability. Typically, a travel time in the 95th percentile is used to describe the reliability of a trip or the variance in the time it can take between destinations. Drivers may use this travel-time value to estimate when they need to leave to reach a destination on time. The 95 percent reliable travel times along I-5 are much longer during peak periods compared to travel times during uncongested periods when traffic is at free-flow speeds. Figure 4-5 compares travel times on I-5 from Everett to Seattle for the general purpose, HOV, and Express Lanes. Travel times are provided for travel at posted speeds, average travel time during peak conditions, and travel time required to ensure on-time arrival 95 percent of the time. As shown in Figure 4-5, vehicles traveling from Everett to Seattle during the AM peak period and using the general purpose lanes would arrive on time 95 percent of the time if they allowed 66 minutes to complete the trip. A vehicle trip in the HOV lane would take 50 minutes, a

savings of 16 minutes. The travel time from Everett to Seattle at the posted speed limit (i.e., no congestion) is 22 minutes, meaning that the AM peak period congestion causes a traveler to allot 44 additional minutes of time for the trip if using the general purpose lanes, and 38 additional minutes if using the HOV lanes.



Source: The 2012 Congestion Report, WSDOT

Figure 4-5. Travel-Time Reliability for the Everett-to-Seattle Commute

General Purpose Lane Performance

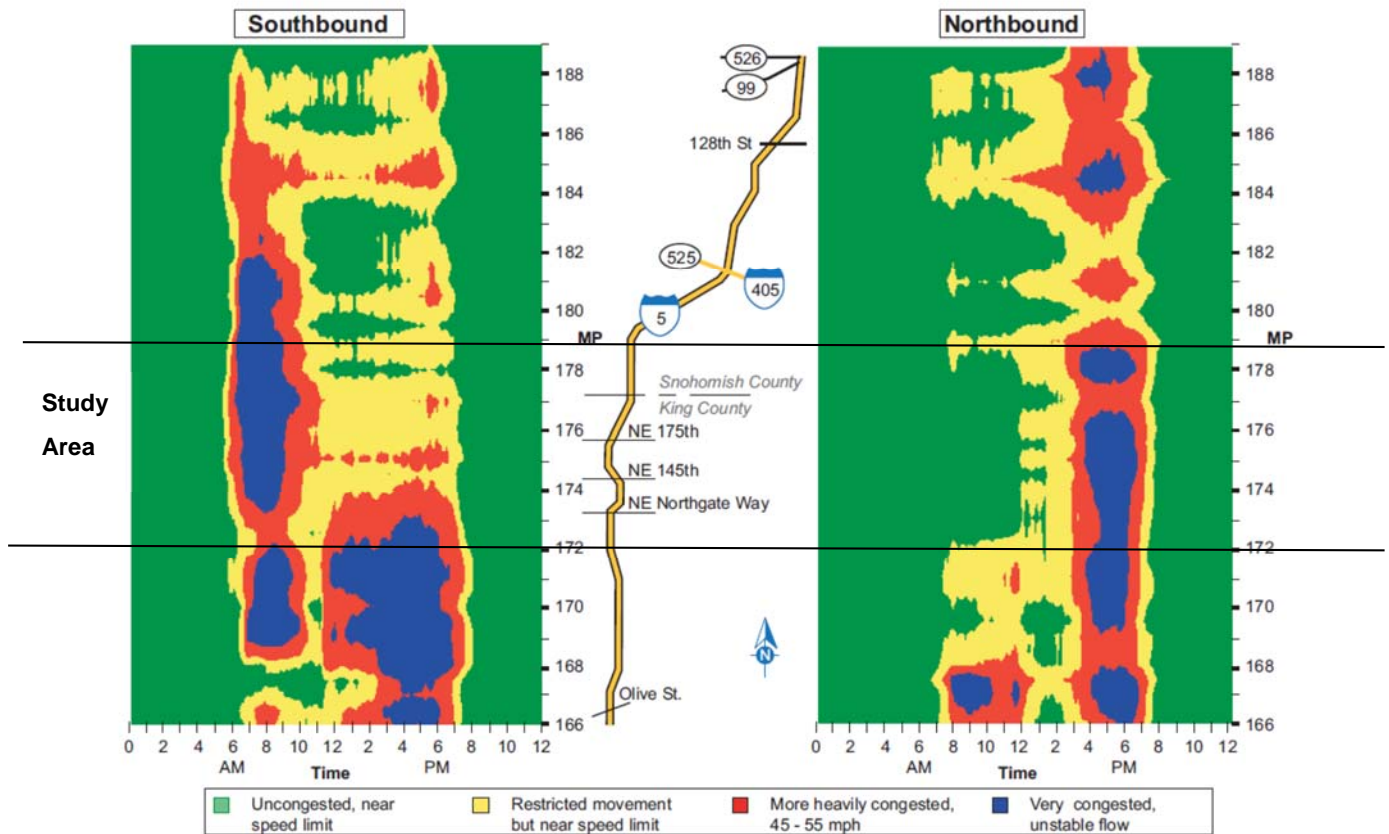
Data provided by WSDOT show recurring congestion based on I-5 travel speeds for the AM and PM peak periods. Figure 4-6 illustrates the average congestion levels along I-5 between downtown Seattle and Everett over a 24-hour period. I-5 operates at over capacity during many hours of the day.⁸ Afternoon southbound traffic on I-5 regularly backs up into Shoreline for a variety of reasons: (1) congestion is emanating from as far south as downtown Seattle, and (2) the express lanes are serving northbound traffic, hence providing proportionately less capacity southbound south of Northgate. If the express lanes were to serve southbound traffic during the PM peak period, congestion would still be likely to occur, although it would not be as severe. To better understand congestion levels along I-5, it is helpful to look at not only average traffic congestion but also the frequency of congestion. Congestion frequency measures the times and locations that heavy congestion is likely to occur and, therefore, can be an indicator of the “reliability” of good travel performance in an area. Figure 4-7 shows the frequency of significant congestion in terms of the number of weekdays per week that congestion occurs. As shown in Figure 4-7, not only does this stretch of I-5 operate at over capacity many hours of the day (as shown in Figure 4-6), but it also operates at over capacity for many days each week.⁹

Additional WSDOT measures of congestion are provided in Figures 4-8 and 4-9. These figures illustrate three measures of travel time for general purpose vehicles over a 24-hour period on I-5 between downtown Seattle and the SR 526 interchange: (1) average travel time; (2) 95th percentile travel time; and (3) the likelihood of a “slow” trip, defined as an average overall trip speed on the freeway of less than approximately 35 mph for 2007 traffic conditions.

Northbound trips from downtown Seattle to south Everett experience only minor slowing throughout the day until about 2:00 pm, when trip times begin to steadily increase, peaking between 4:00 pm and 5:00 pm, and a steady decline to uncongested conditions at around 7:30 pm. Average trip times during the PM peak period are approximately 80 percent longer than those during the off-peak period, with 95th percentile travel times being more than 100 percent higher than those during the off-peak period. There is a moderate (50 percent) likelihood of a slow trip during the PM peak period.

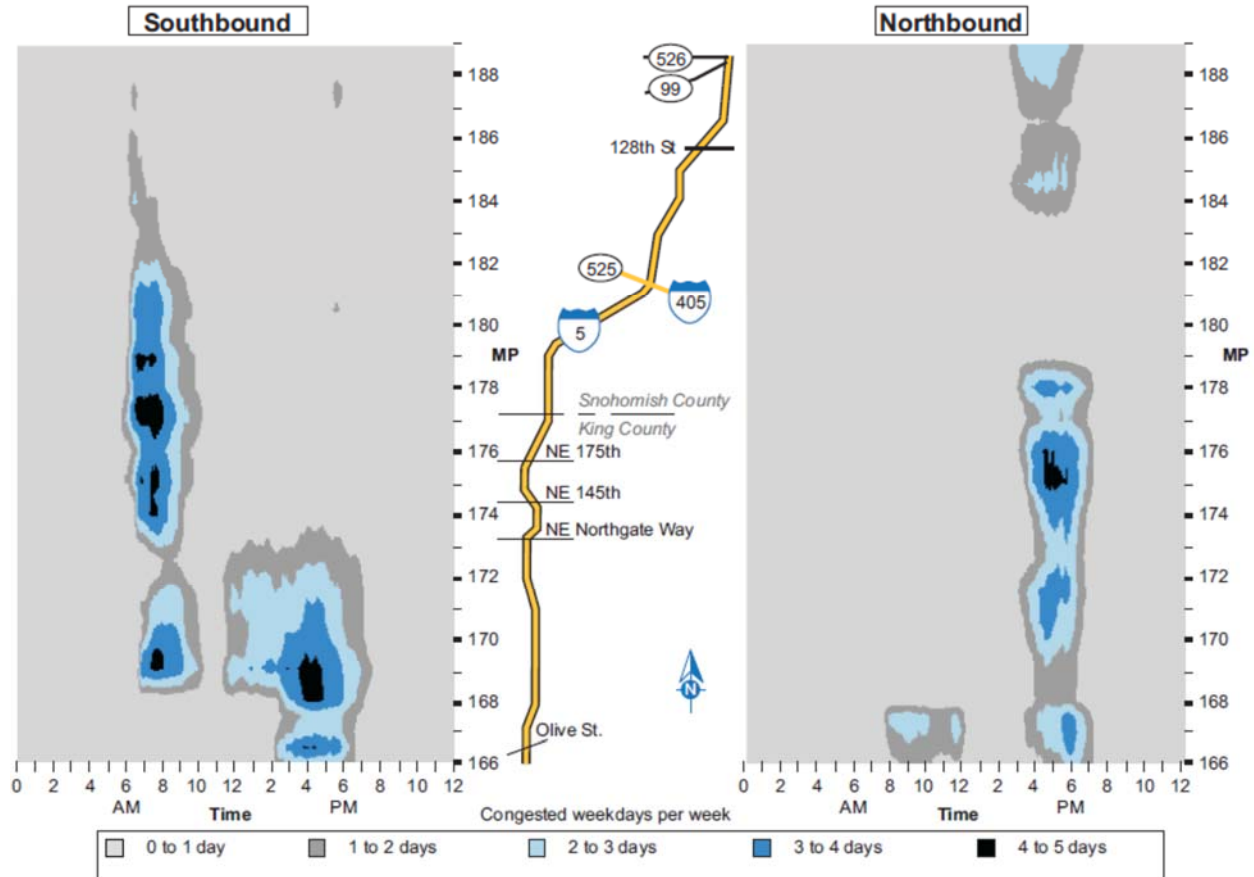
⁸ WSDOT & Washington State Transportation Center (TRAC), Central Puget Sound Freeway Network Usage and Performance Report, 2003 Update, 2005: <http://depts.washington.edu/trac/bulkdisk/pdf/623.1.pdf>

⁹ Ibid



Note: "MP" = milepost

Figure 4-6. I-5 North—General Purpose Traffic Congestion (2006)



Note: "MP" = milepost

Figure 4-7. Frequency of Significant Congestion on I-5 North—General Purpose Lanes, 2006 Weekday Average

In the southbound direction, travel times increase during both the morning and afternoon commutes. Average trip times during the AM peak period are twice as long as those during the off-peak period. Trip times decrease during the midmorning hours but increase again in the early afternoon, gradually peaking around 4:00 pm, which is about 70 percent higher than trip times during off-peak uncongested periods. The likelihood of a southbound trip with an average speed of less than 35 mph is up to almost 70 percent during the middle of the AM peak period and around 45 percent during the PM peak period.

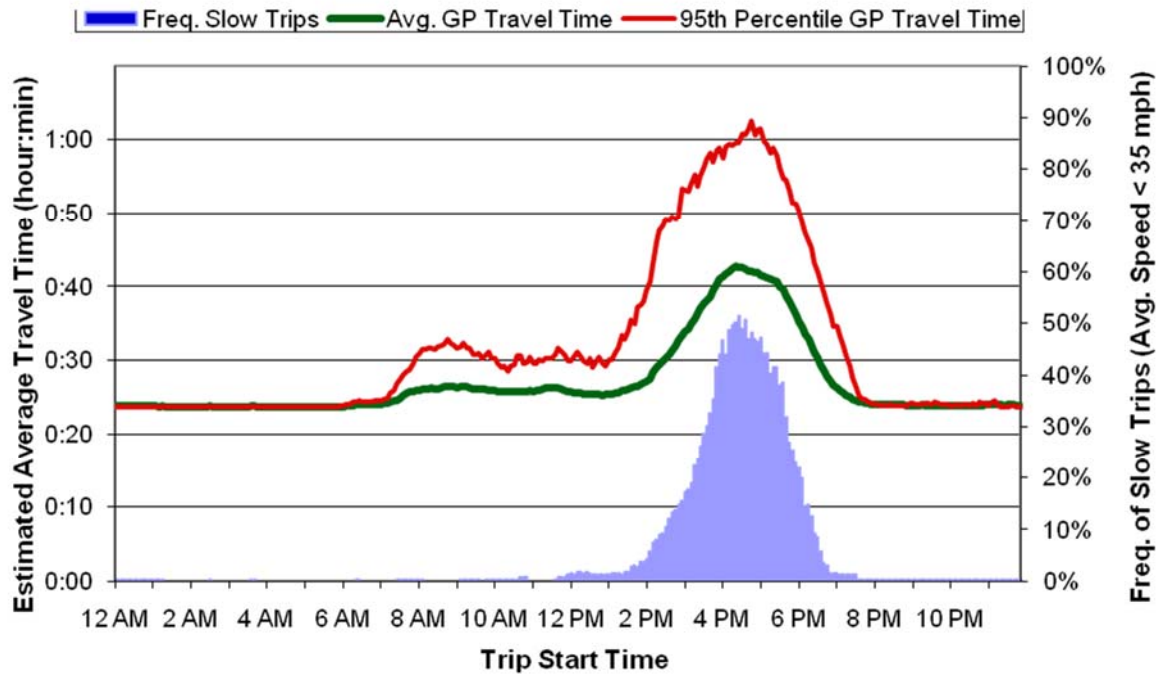


Figure 4-8. Estimated Average Weekday Travel Times (2006)—Seattle Central Business District to SR 526 Interchange: Northbound General Purpose Lanes (23.7 Miles)

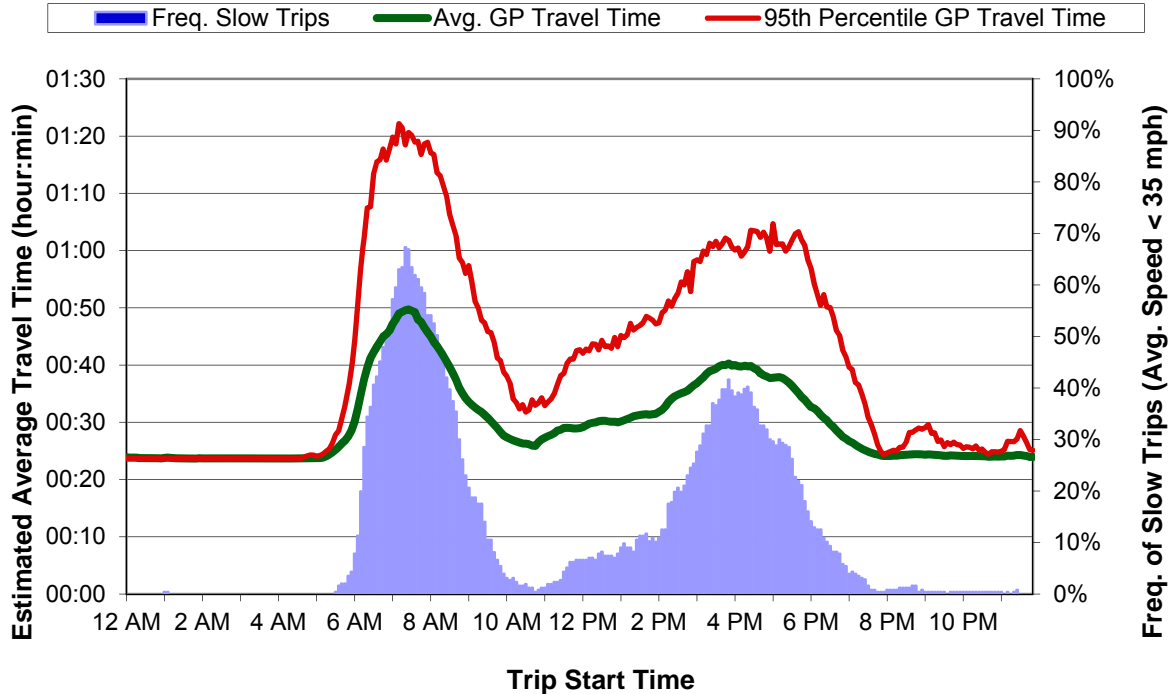


Figure 4-9. Estimated Average Weekday Travel Times (2006)—SR 526 Interchange to Seattle Central Business District: Southbound General Purpose Lanes (23.7 Miles)

HOV Lane Performance

The HOV lanes along I-5 are for vehicles with two or more passengers. According to a 2002 study by the Washington State Transportation Center,¹⁰ the northbound HOV lane near Northgate can exceed 1,500 vehicles per hour during the afternoon commute, which is comparable to the adjacent general purpose lanes. Hence, the HOV lanes tend to be congested in the peak directions during the peak periods, although not to the level of the general purpose lanes because the magnitude of volumes in the general purpose lanes is causing congestion and slower travel speeds in the HOV lanes. With no physical separation between the HOV and general purpose lanes, as well as non-standard lane widths and limited shoulder width to the left of the HOV lane, congestion in the general purpose lanes also affects the operation of the HOV lanes. Also, the high number of buses using the HOV lane can contribute to congestion in the HOV lane.

In addition, in some locations buses using I-5 must weave across the general purpose lanes when entering or exiting the freeway, except at the Lynnwood Transit Center and Mountlake Terrace Freeway Station, where buses use the direct-access ramps to access the HOV lane. While this movement does not have a significant impact on traffic in the general purpose lanes, it does cause additional delay to buses making this movement.

WSDOT's adopted public policy regarding HOV lane performance is that a driver in an HOV lane should be able to maintain an average speed of 45 mph or more at least 90 percent of the time during the peak hour for both the morning and afternoon. As shown in Figures 4-10 through 4-12, the HOV lanes on I-5 are currently not meeting this performance standard.^{11, 12} This low level of performance in the HOV lanes affects the ability of bus transit service to maintain schedules and provide fast, reliable service. In addition, buses traveling in the non-peak direction (e.g., southbound during the PM peak period) must travel in general purpose lanes from Northgate to downtown Seattle because the reversible express lanes operate in the peak direction only. Thus, these bus trips are subject to general purpose traffic congestion for that portion of the trip.

¹⁰ TRAC, HOV Lane Performance Monitoring 2002 Report – Volume 2, 2004: <http://depts.washington.edu/trac/bulkdisk/pdf/584.1.pdf>

¹¹ WSDOT, HOV Policy, 2010: <http://www.wsdot.wa.gov/HOV/Policy.htm>

¹² TRAC, Executive Summary for HOV Action Plan Phase 1, WSDOT project T4118-24, April 2008

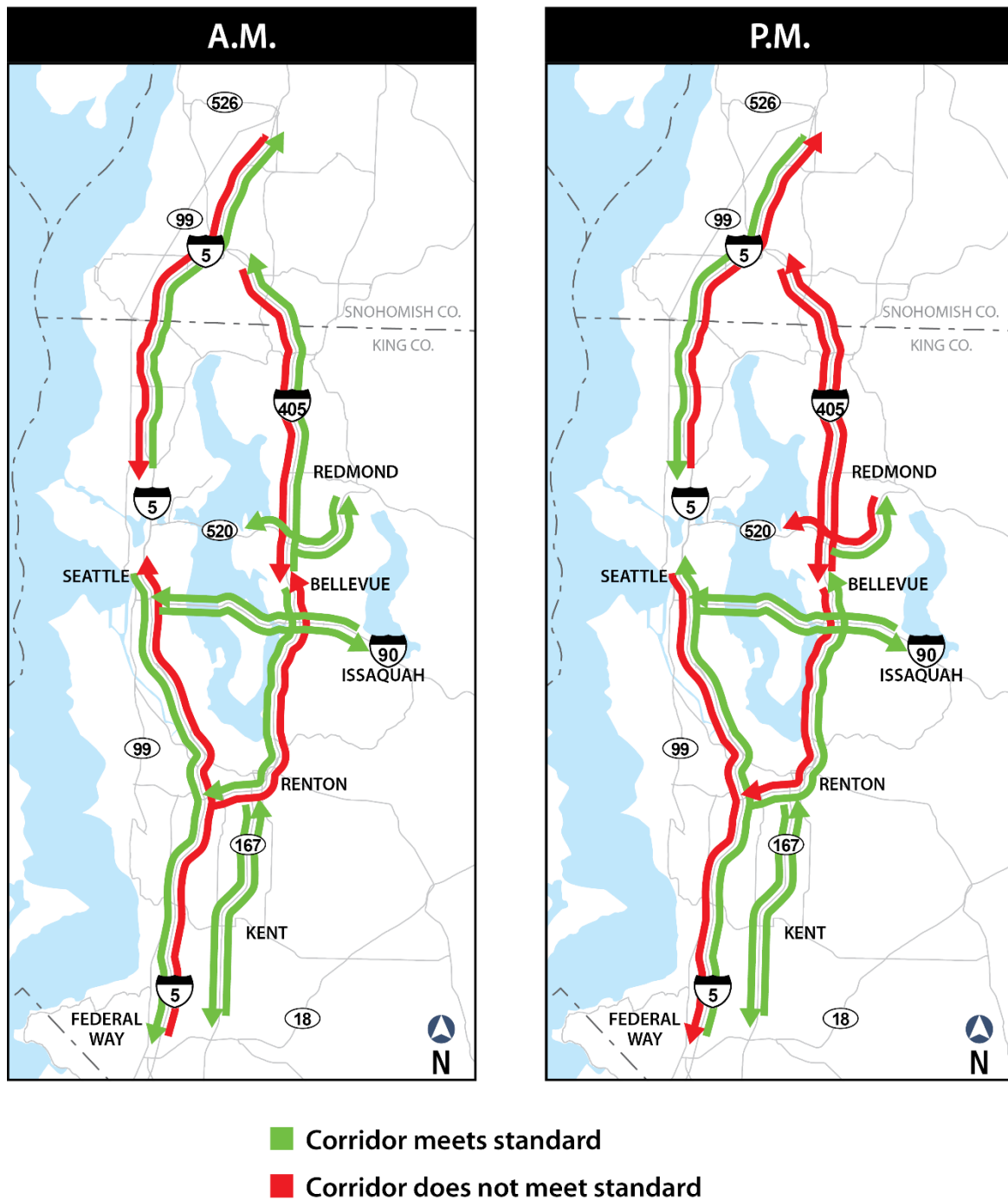


Figure 4-10. HOV Lane Performance Standard

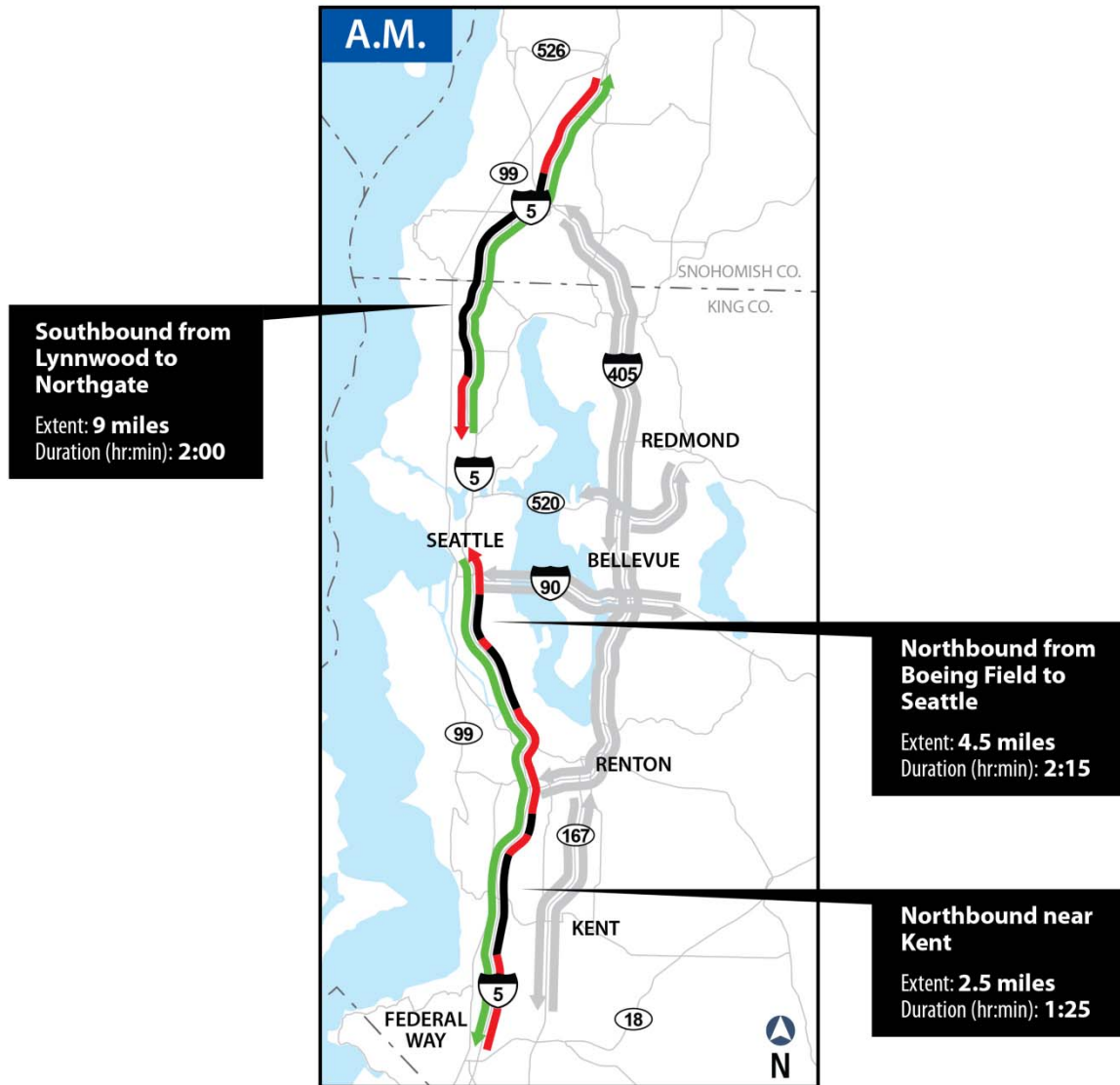


Figure 4-11. Heavily Congested Segments (AM)

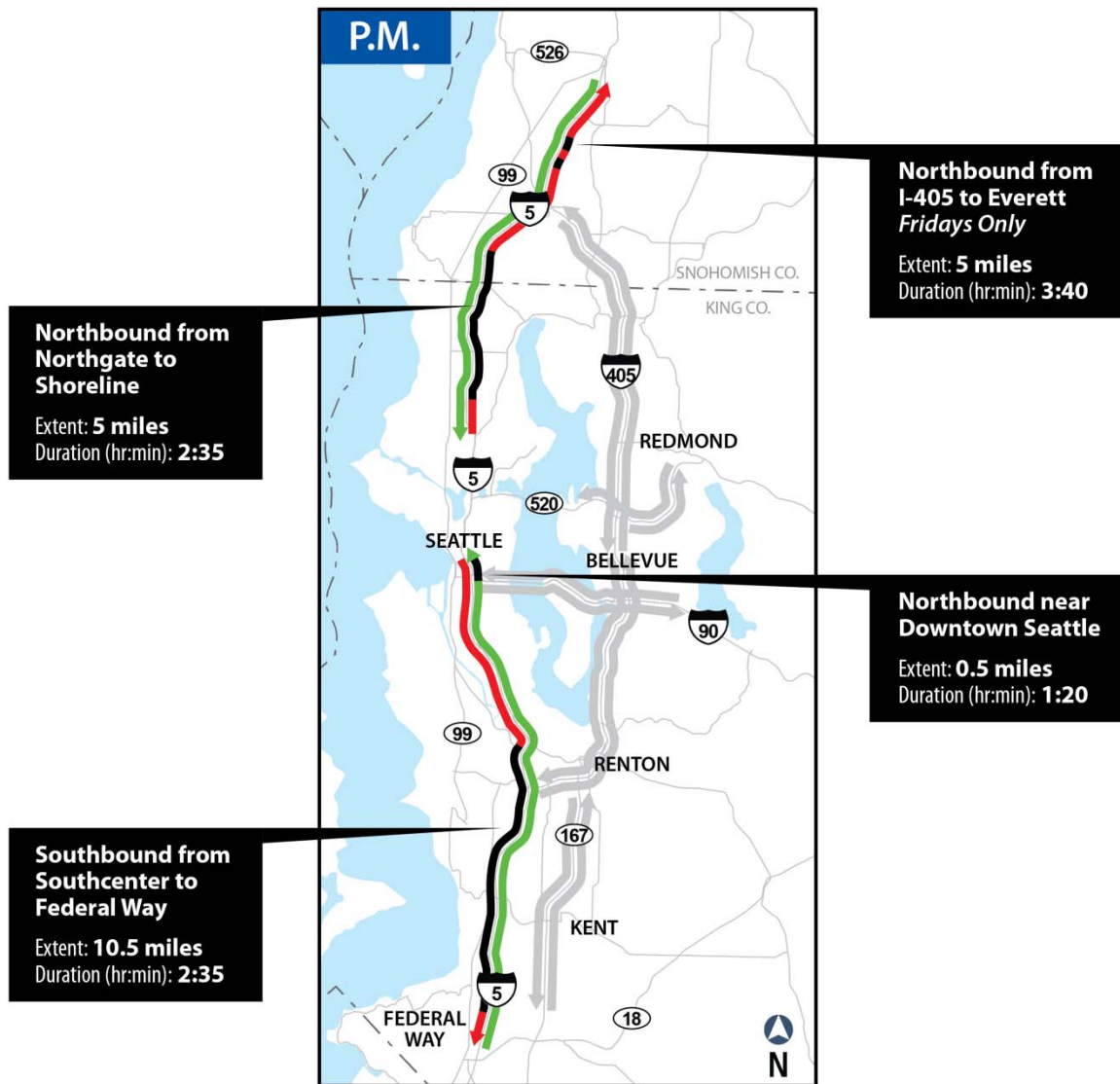


Figure 4-12. Heavily Congested Segments (PM)

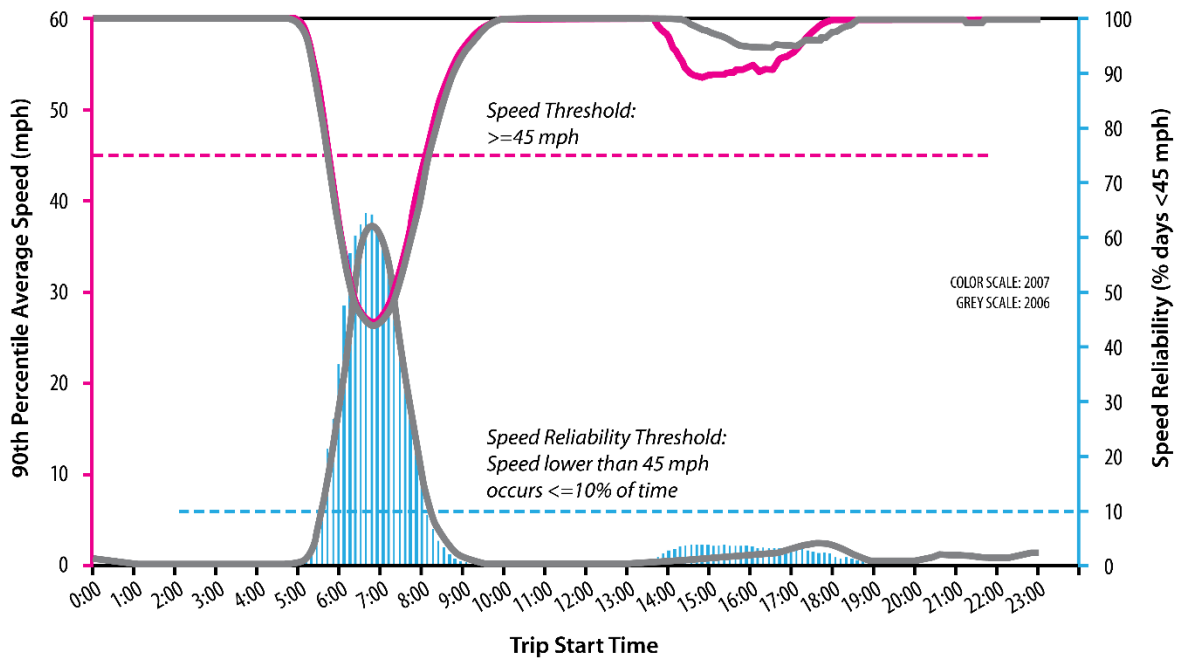
The portion of the I-5 HOV system from downtown Seattle to Lynnwood suffers from significant geometric limitations that, when combined with high vehicle volumes, cause congestion. The most significant bottlenecks are at the entrances and exits to the reversible express lanes where there is considerable lane changing when many vehicles enter and leave the HOV lanes to and from the general purpose lanes.¹³

In addition to high volumes and changes in geometry, congestion in the HOV lanes can also be caused by the interaction between HOV lane traffic and nearby slow traffic in the general purpose lane (i.e., “lane friction”) because drivers in the HOV lane are reluctant to travel at speeds that are significantly greater than the speed of vehicles in the adjacent lane. Also, when drivers in the HOV lane need to leave the HOV lane and enter the congested general purpose lane, congestion can result as the driver slows down to wait for a gap in the adjacent lane. As HOV traffic merges from on-ramps (either via general purpose lanes or from HOV direct-access ramps), congestion can also occur in the HOV lane. Finally, traffic incidents are a frequent cause of congestion for both general purpose and HOV lanes. These can take the form of incidents in the HOV lane that block traffic directly, incidents in the general purpose lanes that contribute to lane friction, or disabled vehicles in the shoulder, again causing lane friction.

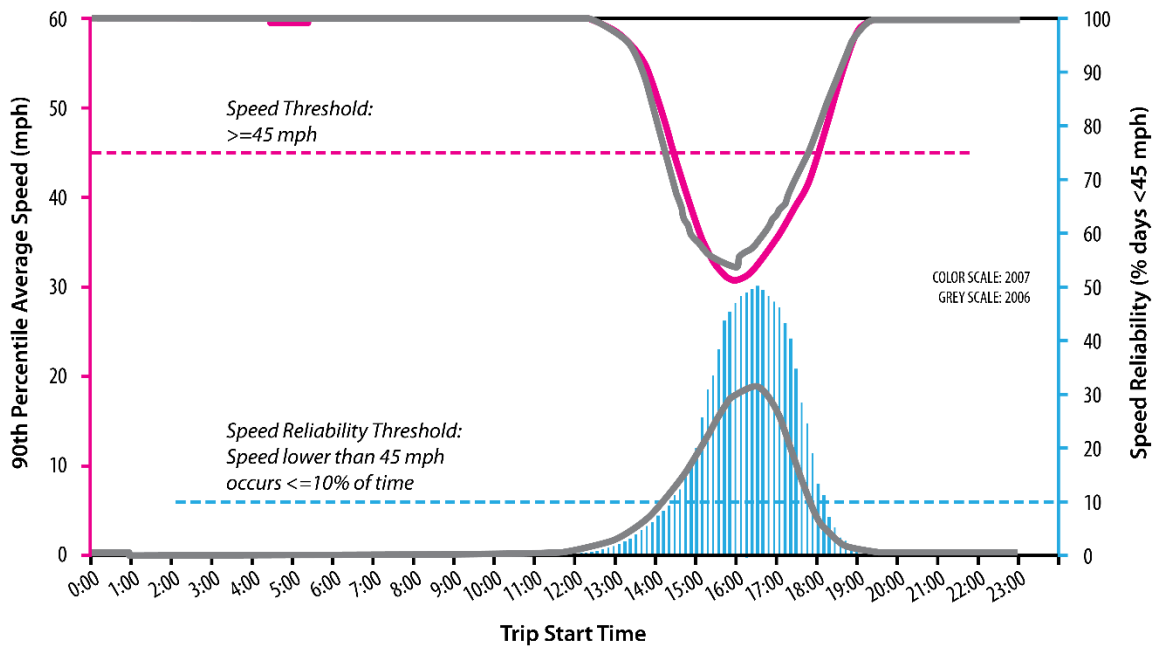
According to the Washington State Transportation Center, the HOV lanes become congested precisely when most transit service is using them. In the morning, southbound I-5 north of Northgate is “one of the most routinely congested freeway segments in the metropolitan area, and the HOV lanes are severely affected by this congestion.”¹⁴ As indicated previously, WSDOT adopted policy regarding HOV lane performance is that HOV lanes are considered reliable if speeds are below 45 mph less than 10 percent of the time. This reliability threshold is illustrated in Figure 4-13, which also shows the change in HOV lane speed and reliability between 2006 and 2007. For the I-5 southbound lanes, there is little change during the AM peak period. The southbound HOV lane operates between 25 and 35 mph over the entire AM peak period, well below the 45-mph speed threshold. Figure 4-14 shows that while speeds for the northbound HOV lane remained relatively similar over the PM peak period (30 to 40 mph) for 2006 and 2007, the probability of having a slow trip increased from 30 percent in 2006 to almost 50 percent in 2007.

¹³ TRAC, HOV Lane Performance Monitoring 2002 Report – Volume 2, 2004:
<http://depts.washington.edu/trac/bulkdisk/pdf/584.1.pdf>

¹⁴ TRAC, HOV Lane Performance Monitoring 2002 Report – Volume 1, 2004:
<http://depts.washington.edu/trac/bulkdisk/pdf/584.2.pdf>



**Figure 4-13. Change in HOV Lane Speed and Reliability—
I-5 Southbound, SR 526 to Northgate (16.6 Miles)**



**Figure 4-14. Change in HOV Lane Speed and Reliability—
I-5 Northbound, Northgate to SR 526 (16.6 Miles)**

4.2 Transit

This section describes existing conditions for regional and local transit facilities, operations, and services within the project area and the Lynnwood Link Extension's impacts on those transit facilities and services.

- Daily bus ridership in the Lynnwood Link Extension corridor is approximately 19,400 riders on I-5 bus routes north of Northgate, which reflects the highest transit ridership of any corridor in the region.
- Southbound transit trips from Shoreline during the AM peak period are 16 minutes to Northgate and 66 minutes to Seattle-Tacoma International Airport (Sea-Tac Airport), while trips from Lynnwood are 36 minutes to downtown Seattle and 79 minutes to the airport.
- Transit passenger level of service (LOS) for service frequency for trips between the corridor and regional destinations currently ranges generally between LOS A and LOS D. Some regional locations are not served with direct (i.e., one-seat, no transfer) bus service from within the corridor.
- Transit passenger level of service for hours of service currently ranges between LOS A and LOS B for trips between the corridor and most regional destinations. However, there are a few destinations for which trips from the corridor are experiencing LOS E or worse conditions.
- Transit passenger level of service for passenger load for trips between the corridor and regional destinations currently ranges between LOS A and LOS B.
- Transit passenger level of service for reliability and on-time performance for trips between the corridor and regional destinations currently ranges between LOS B and LOS C.

4.2.1 Transit Operations and Level of Service

Selected major urban center destinations, transit centers, and transit hubs at potential light rail station areas were used to measure transit (bus and light rail) LOS for the project area. Existing and future regional transit services were evaluated based on the following categories:

- Service characteristics
- Ridership
- Transit travel times
- Transfers

The quality of transit service was evaluated based on the following transit LOS measures:

- Service frequency LOS
- Hours of service LOS
- Passenger load LOS (passenger crowding)
- Reliability of service LOS (on-time performance and headway adherence)

The destinations and transit activity centers used to evaluate transit LOS include major regional urban centers, existing transit centers in the project area, and the areas of potential light rail stations for the alternatives. These include the following:

- Downtown Bellevue
- Sea-Tac Airport
- Downtown Seattle
- Capitol Hill
- University District
- Northgate
- North Seattle (NE 130th Street/NE 145th Street)
- Shoreline (NE 155th Street/NE 185th Street)
- Mountlake Terrace Transit Center
- 220th Street SW
- Lynnwood Transit Center

The transit LOS performance levels were analyzed using the methodology defined by the *Transit Capacity and Quality of Service Manual* (TCQSM), 2nd Edition, Part 3, Transit Research Board, 2003, and Transit Cooperative Research Program (TCRP) Report 100, Transit Research Board, 2003¹⁵. These are nationally recognized resources for the measurement of transit capacity and quality of service. The Transportation Methods and Assumptions Report in Appendix A of this report provides a detailed discussion of the transit LOS methodology.

Similar to how LOS is typically measured for highway or arterial performance in the United States, transit LOS is measured using the letter grades A through F, with LOS A denoting the best performance and LOS F generally considered failing performance. Transit LOS was analyzed for the PM peak hour (5:00 pm to 6:00 pm) to describe

¹⁵ A third edition of this reference document was issued in 2013. However, to maintain consistency with the Draft EIS, the methodology defined in the second edition was used for this report.

transit performance during the period when traffic congestion and transit ridership are typically high. LOS A indicates more frequent service, more hours served during the day, high reliability, and minimal passenger crowding in a transit vehicle. Circulation is defined as the route(s) on which transit operates. Appendix B of this report provides the TCQSM descriptions of each of the transit LOS levels, their ranges, and their grade descriptions. The individual components of transit LOS are defined below.

Service Frequency LOS is the number of times within the PM peak hour that a bus or light rail train stops at a specific location. Generally, the shorter the headway between buses for a transit route, the less time a rider has to wait between bus arrivals; hence, the better the service frequency LOS. Bus routes that have headways of less than 10 minutes are considered LOS A, whereas headways higher than 60 minutes reflect LOS F. Table 4-3 shows thresholds for each LOS level.

Table 4-3. Service Frequency LOS Thresholds

LOS	Average Headway (minutes)	Vehicles per Hour	Comments
A	<10	>6	Passengers do not need schedules
B	10–14	5–6	Frequent service, passengers consult schedules
C	15–20	3–4	Maximum desirable time to wait if bus/train missed
D	21–30	2	Service unattractive to choice riders
E	31–60	1	Service available during the hour
F	>60	<1	Service unattractive to all riders

Source: Transit Capacity and Quality of Service Manual

Hours of Service LOS is the total transit operating hours provided within a 24-hour (daily) period. Hours of service LOS is intended to measure the availability of transit service to riders and potential users. The longer that transit service is provided throughout the day, the better the LOS. Table 4-4 shows thresholds for each LOS level.

Table 4-4. Hours of Service LOS Thresholds

LOS	Hours of Service	Comments
A	19–24	Night or “owl” service provided
B	17–18	Late evening service provided
C	14–16	Early evening service provided
D	12–13	Daytime service provided
E	4–11	Peak hour service only or limited midday service
F	0–3	Very limited or no service

Source: Transit Capacity and Quality of Service Manual

Passenger Load LOS is intended to measure passenger comfort and the ability of a rider to find a seat on the bus or train during the PM peak hour. Passenger load LOS also measures crowding in the transit vehicle. On buses, passenger load LOS is defined by the number of passengers per seat. For light rail, passenger load LOS is a measure of square footage available for standing per standing passenger. Passenger load LOS A indicates that riders are able to spread out on the vehicle along with the potential to use empty seats for storing parcels and/or bags instead of carrying them on their laps. A passenger load LOS at or worse than LOS D may reflect overcrowding, and the transit service provider may need to increase service frequency to improve LOS. In addition, a large number of passengers can cause the bus to dwell longer at stops resulting from crowded passenger boarding and alighting. The longer dwell time can negatively affect travel time and service reliability. Table 4-5 shows thresholds for each LOS level.

Table 4-5. Passenger Load LOS Thresholds

LOS	Load Factor (passenger per seat)	Comments
A	0.00–0.50	No passenger need sit next to another
B	0.51–0.75	Passengers can choose where to sit
C	0.76–1.00	All passengers can sit
D	1.01–1.25	Comfortable standee load for design
E	1.26–1.50	Maximum schedule load
F	>1.50	Crush load

Source: Transit Capacity and Quality of Service Manual

Reliability of Service LOS was analyzed at major transit hubs within the project corridor. The reliability LOS measures the degree to which a transit vehicle meets or misses the scheduled headway at its arrival station. This includes both a transit vehicle arriving late and also a transit vehicle leaving early from a stop. A bus leaving early would mean that some transit riders would miss their bus. Two methods were used to determine transit reliability. For transit routes with scheduled headways greater than 10 minutes, on-time reliability was evaluated in terms of on-time performance, defined as being 0 to 5 minutes late. For transit routes operating at scheduled headways of 10 minutes or less, headway adherence (calculated as the coefficient of variation) was used to determine reliability. Reliability was calculated using the TCQSM methodology, which compares the standard deviation of actual headways to scheduled headways of transit routes at major transit centers and park-and-ride lots within the project area. On-time performance for June 2012 was provided by Sound Transit staff for Sound Transit Express routes operating in the corridor. Table 4-6 shows the thresholds for each LOS level.

Table 4-6. Reliability of Service LOS Thresholds

LOS	On-Time Percentage	Comments ^a
A	95.0–100.0%	1 late transit vehicle every 2 weeks (no transfer)
B	90.0–94.9%	1 late transit vehicle every week (no transfer)
C	85.0–89.9%	3 late transit vehicles every 2 weeks (no transfer)
D	80.0–84.9%	2 late transit vehicles every week (no transfer)
E	75.0–79.9%	1 late transit vehicle every day (with a transfer)
F	<75.0%	1 late transit vehicle at least daily (with a transfer)

^a Individual's perspective based on five round trips per week.

Source: Transit Capacity and Quality of Service Manual

4.2.2 Regional Transit

Service Characteristics

Transit services within the project area are provided by Community Transit, King County Metro, and Sound Transit. Bus routes along I-5 are operated by Sound Transit, Community Transit, and King County Metro, and they provide long-distance service between major transit centers in the project area and major urban centers in the region. Sound Transit's ST Express regional bus service provides two-direction, all-day service between major regional destinations. Community Transit and King County Metro services along I-5 in the project area are primarily peak-direction, peak-period service, which is oriented to commuters.

Swift, Community Transit's bus rapid transit service, operates along the Snohomish County portion of the SR 99 corridor to the west of the study area. King County Metro's RapidRide E Line began service on Aurora Avenue North in February 2014. Local buses provide service to several transit centers, park-and-ride facilities, neighborhoods, and activity centers. The frequency and number of bus routes in service increase during the peak periods, primarily in the peak direction of travel. These routes connect park-and-rides and transit centers in Snohomish and North King counties with major employment centers in Seattle. Table 4-7 lists the existing bus routes serving the project area. Two routes were eliminated in September 2014. They remain in Table 4-7 to disclose that they were included in the transit model.

Table 4-7. Existing Bus Routes Evaluated in the Project Area

Route	Stop Locations in Project Area	Service Area	Schedule (with headways)
CT 110	Mountlake Terrace Transit Center, 220th Street SW	Mountlake Terrace, Edmonds (eliminated September, 2014)	Weekdays (6:00 am to 8:30 am, 3:45 pm to 6:15 pm) every 30 minutes
CT 111	Mountlake Terrace Transit Center	Mountlake Terrace, Brier	Weekdays (5:15 am to 7:30 am, 4:30 pm to 7:00 pm) every 30 minutes in peak direction
CT 112	Mountlake Terrace Transit Center	Mountlake Terrace, Brier, Lynnwood, Swamp Creek, Ash Way	Weekdays (6:00 am to 10:00 pm) every 30 minutes Saturdays (6:15 am to 9:15 pm) every 60 minutes
CT 115	Lynnwood Transit Center	Aurora Village, Edmonds, Lynnwood, Alderwood, Swamp Creek, Ash Way, Mill Creek, Mariner	Weekdays (5:15 am to 10:00 pm) every 30 minutes Saturdays (5:45 am to 10:30 pm) every 60 minutes
CT 116	Lynnwood Transit Center	Edmonds, Lynnwood, Alderwood, Swamp Creek, Ash Way, Mill Creek, Silver Firs	Weekdays (5:30 am to 10:30 pm) every 30 minutes Saturdays (6:00 am to 10:00 pm) every 60 minutes
CT 119	Mountlake Terrace Transit Center	Mountlake Terrace, Brier, Lynnwood, Ash Way	Weekdays (6:15 am to 10:15 pm) every 30 minutes Saturdays (6:15 am to 10:00 pm) every 60 minutes
CT 120	Lynnwood Transit Center	Lynnwood, Canyon Park	Weekdays (5:30 am to 9:45 pm) every 30 minutes Saturdays (6:15 am to 10:00 pm) every 60 minutes
CT 130	Mountlake Terrace Transit Center, Lynnwood Transit Center	Lynnwood, Mountlake Terrace, Aurora Village, Edmonds	Weekdays (5:30 am to 10:00 pm) every 30 minutes Saturdays (6:30 am to 10:00 pm) every 60 minutes
CT 201	Lynnwood Transit Center	Lynnwood, Alderwood, Swamp Creek, Ash Way, Mill Creek, Mariner, Everett, Marysville, Smokey Point	Weekdays (4:45 am to 11:00 pm) every 40 minutes Saturdays (6:15 am to 10:00 pm) every 60 minutes
CT 202	Lynnwood Transit Center	Lynnwood, Alderwood, Swamp Creek, Ash Way, Mill Creek, Mariner, Everett, Marysville, Smokey Point	Weekdays (5:00 am to 10:30 pm) every 40 minutes Saturdays (5:45 am to 9:30 pm) every 60 minutes
CT 402	Lynnwood Transit Center	Downtown Seattle, Lynnwood	Weekdays (5:15 am to 9:00 am, 2:30 pm to 7:15 pm) every 15 minutes in peak direction
CT 405	220th Street SW	Downtown Seattle, Mountlake Terrace, Edmonds	Weekdays (6:00 am to 8:30 am, 3:15 pm to 6:45 pm) every 30 minutes in peak direction
CT 413	Mountlake Terrace Transit Center	Downtown Seattle, Mountlake Terrace, Lynnwood	Weekdays (5:00 am to 9:00 am, 3:00 pm to 7:00 pm) every 15 minutes in peak direction
CT 415	Mountlake Terrace Transit Center	Downtown Seattle, Mountlake Terrace, Lynnwood	Weekdays (5:45 am to 9:00 am, 3:30 pm to 6:30 pm) every 15 minutes in peak direction
CT 417	Lynnwood Transit Center	Downtown Seattle, Lynnwood, Mukilteo	Weekdays (6:30 am to 9:15 am, 3:15 pm to 6:15 pm) every 30 minutes in peak direction

Table 4-7. Existing Bus Routes Evaluated in the Project Area

Route	Stop Locations in Project Area	Service Area	Schedule (with headways)
CT 421	Lynnwood Transit Center	Downtown Seattle, Lynnwood, Marysville	Weekdays (4:45 am to 8:15 am, 2:30 pm to 7:00 pm) every 30 minutes in peak direction
CT 422	Lynnwood Transit Center	Downtown Seattle, Lynnwood, Marysville, Stanwood	Weekdays (5:15 am to 8:00 am, 4:15 pm to 7:15 pm) every 60 minutes in peak direction
CT 425	Lynnwood Transit Center	Downtown Seattle, Lynnwood, Lake Stevens	Weekdays (5:30 am to 8:00 am, 3:30 pm to 6:30 pm) every 30 minutes in peak direction
CT 810	Mountlake Terrace Transit Center, Lynnwood Transit Center	University District, Mountlake Terrace, Lynnwood, Mill Creek, Everett	Weekdays (9:15 am to 11:15 am, 6:00 pm to 7:30 pm) every 30 minutes in peak direction
CT 821	Lynnwood Transit Center	University District, Lynnwood, Marysville	Weekdays (5:30 am to 8:15 am, 3:30 pm to 6:15 pm) every 30 minutes in peak direction
CT 855	Lynnwood Transit Center	University District, Mountlake Terrace, Lynnwood	Weekdays (6:15 am to 9:15 am, 12:30 pm to 6:00 pm) every 15 minutes in peak direction
CT 871	Mountlake Terrace Transit Center, 220th Street SW	University District, Mountlake Terrace, Edmonds	Weekdays (6:00 am to 10:15 am, 12:30 pm to 6:30 pm) every 15 minutes in peak direction
CT 885	Lynnwood Transit Center	University District, Mountlake Terrace, Lynnwood	Weekdays (5:45 am to 6:15 am, 3:00 pm to 5:30 pm) every 60 to 90 minutes in peak direction
KCM 41	NE 130th Street	Downtown Seattle, University District, Northgate, Lake City	Weekdays (4:45 am to 1:45 am) every 5 to 15 minutes Saturdays (5:45 am to 1:45 am) every 15 minutes Sundays (6:15 am to 1:45 am) every 30 minutes
KCM 242	NE 130th Street, NE 145th Street	Jackson Park, Northgate, Ravenna, Montlake, Bellevue, Overlake	Weekdays (5:45 am to 10:00 am, 3:30 pm to 7:15 pm) every 30 minutes in peak direction
KCM 243	NE 130th Street, NE 145th Street	Jackson Park, Lake City, Ravenna, Montlake, Bellevue (eliminated September, 2014)	Weekdays (6:30 am to 8:30 am, 4:15 pm to 6:15 pm) every 30 to 60 minutes in peak direction
KCM 301	NE 145th Street	Downtown Seattle, University District, Jackson Park, Shoreline, Richmond Beach	Weekdays (4:30 am to 9:00 am, 3:00 pm to 6:30 pm) every 15 minutes
KCM 303	NE 145th Street	Downtown Seattle/First Hill, Northgate, Jackson Park Shoreline	Weekdays (5:30 am to 9:00 am, 3:30 pm to 8:00 pm) every 15 minutes in peak direction
KCM 304	NE 145th Street	Downtown Seattle, Jackson Park, Shoreline, Richmond Beach	Weekdays (6:15 am to 8:30 am, 3:30 pm to 6:30 pm) every 30 minutes in peak direction
KCM 308	NE 145th Street	Downtown Seattle, Jackson Park, Lake City, Lake Forest Park, Horizon View	Weekdays (5:45 am to 8:30 am, 4:00 pm to 6:45 pm) every 30 to 60 minutes in peak direction
KCM 316	None	Downtown Seattle, Northgate, Haller Lake, Meridian Park	Weekdays (6:00 am to 8:45 am, 4:00 pm to 7:00 pm) every 20 minutes in peak direction

Table 4-7. Existing Bus Routes Evaluated in the Project Area

Route	Stop Locations in Project Area	Service Area	Schedule (with headways)
KCM 330	NE 145th Street, NE 155th Street	Shoreline, Fircrest, Lake City	Weekdays (6:30 am to 9:15 am, 12:30 pm to 6:15 pm) every 30 to 60 minutes
KCM 345	None	Northgate, Greenwood, Shoreline	Weekdays (6:15 am to 11:15 am) every 30 minutes Saturdays (7:15 am to 10:45 pm) every 30 minutes Sundays (7:15 am to 10:45 pm) every 60 minutes
KCM 346	None	Northgate, Haller Lake, Meridian Park, Shoreline	Weekdays (5:15 am to 11:30 am) every 30 minutes Saturdays (6:00 am to 12:00 pm) every 30 minutes Sundays (6:30 am to 12:00) every 60 minutes
KCM 347	NE 145th Street, Mountlake Terrace Transit Center	Northgate, Jackson Park, North City, Ballinger Terrace, Mountlake Terrace	Weekdays (5:15 am to 12:15 am) every 30 minutes Saturdays (7:00 am to 11:00 pm) every 30 minutes Sundays (6:30 am to 10:30 pm) every 30 minutes
KCM 348	NE 185th Street	Northgate, Shoreline, Richmond Beach	Weekdays (5:30 am to 11:30 pm) every 30 minutes Saturdays (6:00 am to 12:15 am) every 30 minutes Sundays (6:00 am to 12:15 am) every 30 minutes
KCM 373	NE 145th Street	University District, Ravenna, Jackson Park, Shoreline, Aurora Village	Weekdays (6:15 am to 10:15 am, 1:30 pm to 7:30 pm) every 15 to 30 minutes in peak direction
ST 510	(None) The 512 becomes the 510 for the peak period, peak direction.	Downtown Seattle to Everett	Weekdays (4:20 am to 9:00 am, 3:00 pm to 7:00 pm) every 10 minutes in peak direction;
ST 512	NE 145th Street, Mountlake Terrace Transit Center, Lynnwood Transit Center	Downtown Seattle, University District, Jackson Park, Mountlake Terrace, Lynnwood, Ash Way, Everett	Weekdays off peak direction and off peak (5:30 am to 1:00 am) every 15 minutes Weekends (5:30 am to 1:00 am) every 30 minutes
ST 511	Mountlake Terrace Transit Center, Lynnwood Transit Center	Downtown Seattle, Mountlake Terrace, Lynnwood, Ash Way	Weekdays peak period, peak direction (4:20 am to 9:00 am, 2:30 pm to 7:00 pm) every 20 minutes
ST 513	Mountlake Terrace Transit Center	Downtown Seattle, Mountlake Terrace, Everett	Weekdays (5:30 am to 9:00 am, 3:45 pm to 7:00 pm) every 15 to 30 minutes
ST 535	Lynnwood Transit Center	Lynnwood, Alderwood, Canyon Park, UW Bothell, Totem Lake, Downtown Bellevue	Weekdays (4:45 am to 11:00 pm) every 30 minutes Saturdays (7:15 am to 11:00 pm) every 60 minutes

Note: Transit routes are from spring 2012 schedules obtained from King County Metro and Sound Transit Web sites:

<http://www.kingcounty.gov> and <http://www.soundtransit.org>.

Source: Community Transit (2012); King County Metro (2012); Sound Transit (2014). Routes eliminated in September, 2014 that were included in the transit model remain in the table.

CT = Community Transit

KCM = King County Metro

ST = Sound Transit

The major transfer points within the project area are transit centers and park-and-ride facilities. Community Transit, King County Metro, and Sound Transit provide service to these facilities. There are three transit centers within the I-5 corridor at Northgate, Mountlake Terrace, and in downtown Lynnwood. The Northgate Transit Center is accessed by general purpose ramps to and from the I-5 mainline and express lanes (to and from the south only). There are freeway flyer stops at NE 145th Street (northbound and southbound) that are accessed from the outside general purpose lanes. Regional transit serving these flyer stops is limited because transit must leave the inside HOV lane and weave through congested general purpose lanes to exit to the flyer stops and then weave again to re-enter the inside HOV lanes. Regional transit accesses the Mountlake Terrace Transit Center using the in-line freeway station. Regional transit serves the Lynnwood Transit Center from the HOV lanes to direct access ramps that lead to 46th Avenue West.

Within Segment A there are two small park-and-ride lots. These facilities connect adjacent neighborhoods with King County Metro buses running along I-5 and regional arterials. These King County Metro routes provide service to a variety of destinations, including downtown Seattle, the University District, Northgate Transit Center, Aurora Village, and Mountlake Terrace Transit Center. Snohomish County has 40 park-and-ride lots, ranging in size from 10 spaces to almost 1,400 spaces, which provide connections to regional transit centers and employment areas, such as downtown Seattle, the University District, and Northgate Transit Center. Table 4-8 lists the existing transit facilities in the project area.

Table 4-8. Existing Transit Facilities in the Project Area

Transit Facility	Type of Facility	Rider Amenities	Served by Routes	Park-and-Ride Stalls
Northgate Transit Center (includes adjacent facilities at Northgate Mall and Thornton Place)	Transit Center, Park-and-Ride	Bicycle Lockers	ST 555, 556 KCM 16, 40, 41, 66, 67, 68, 75, 242, 303, 345, 346, 347, 348, 995	1,523
NE 133rd/5th Avenue NE Park-and-Ride (I-5 at NE 130th Street)	Park-and-Ride		KCM 242, 243	46
North Jackson Park Park-and-Ride (I-5 at NE 145th Street)	Park-and-Ride		ST 510, 511, 512 KCM 242, 243, 301, 303, 304, 308, 347, 373	68
Mountlake Terrace Transit Center (I-5 at 236th Street SW)	Transit Center, Park-and-Ride	Bicycle Lockers	ST 511, 512, 513 CT 110, 111, 112, 119, 130, 413, 415, 810, 871	880
Lynnwood Transit Center	Transit Center, Park-and-Ride	Bicycle Lockers	ST 511, 512, 535 CT 115, 116, 120, 130, 201, 202, 402, 417, 421, 422, 425, 810, 821, 855, 885	1,370

Note: Transit routes and park-and-ride stalls listed as of summer 2012.

Sources: <http://www.communitytransit.org/parking/>,

<http://metro.kingcounty.gov/tops/parknride/pr-north-seattle.html>

CT = Community Transit

ST = Sound Transit

KCM = King County Metro

Community Transit commuter express routes serve regional trips between Snohomish County and urban centers in King County, including downtown Seattle, the University District, and the Eastside. Service is oriented to commuter travel, with higher frequencies provided during the peak period in the peak direction. In addition, Community Transit and Everett Transit provide local service between park-and-ride lots and transit centers throughout Snohomish County. King County Metro provides regional and local service between north Seattle and the county's urban centers. Sound Transit provides regional express bus service in the corridor between major urban centers and transit centers. Table 4-8 lists regional and local bus routes serving the project area.

In general, during the peak periods, the frequency of buses in the peak direction is greater than the frequency of buses running in the opposite “reverse-peak” direction. Midday, off-peak, and weekend transit service is less frequent than during the peak periods. On weekdays, Sound Transit Route 511 operates every 15 minutes in both directions between downtown Seattle and Ash Way Park-and-Ride in Lynnwood.

Ridership

Table 4-9 shows the daily bus ridership for regional bus routes on I-5 north of Northgate, in comparison with various locations on other key transit corridors in the region. Ridership on I-5 at the Ship Canal Bridge includes riders from north of Northgate, in addition to those boarding farther south between Northgate and the Ship Canal. This information shows that the project corridor currently carries the highest bus ridership volumes in the region, and provides a point of comparison with future year (2035) alternatives.

**Table 4-9. Daily Bus Ridership on Selected Regional Corridors
—Base Year (2011)**

Route	Bus Ridership
I-5, North of Northgate Way	19,400
I-5, Ship Canal	33,400
I-5, South of West Seattle Bridge	16,400
I-5, South of I-405	9,200
SR 520, Midspan	16,000
I-90, between Seattle and Mercer Island	11,600
I-90, East of 148th/150th Avenue SE Interchange	4,000
I-405, North of SR 520	4,400
I-405, South of SR 520	4,000

Source: Sound Transit Ridership Forecasting Model

Transit Travel Times

Table 4-10 shows scheduled peak-period transit travel times between Shoreline (I-5 at NE 145th Street) and Lynnwood (Lynnwood Transit Center) and other regional destinations. As shown in Table 4-10, the southbound transit trips from Shoreline during the AM peak period are 16 minutes to Northgate and 66 minutes to Sea-Tac Airport. Transit trips from Lynnwood are 36 minutes to downtown Seattle and 79 minutes to Sea-Tac Airport. The transit travel times from Lynnwood to Northgate exceed the travel time from Lynnwood to the University District (a longer distance) due to the lack of direct service between Lynnwood and Northgate; therefore, passengers must make inefficient transfers.

Table 4-10. Transit Travel Times—AM Peak Period Southbound (minutes)

Destination	From Shoreline	From Lynnwood
Northgate	16	52
University of Washington	25	37
Capitol Hill	30	48
Downtown Seattle	18	36
Sea-Tac Airport	66	79
Downtown Bellevue	49	46
Overlake	65	71

Source: Scheduled transit travel times from King County Metro Trip Planner, <http://metro.kingcounty.gov/>

Table 4-11 shows the transit trip travel times during the PM peak period from regional destinations to Shoreline (NE 145th Street Station) and Lynnwood (Lynnwood Transit Center Station). Longer transit travel times generally occur during the PM peak period in the peak commute direction (northbound) than during the AM peak commute peak direction (southbound) for most origins and destinations. These travel times for both peak periods reflect the congestion in the I-5 general purpose and HOV lanes causing inconsistency in travel times.

Table 4-11. Transit Travel Times—PM Peak Period Northbound (minutes)

Origin	To Shoreline	To Lynnwood
Northgate	7	70
University of Washington	30	32
Capitol Hill	62	60
Downtown Seattle	22	41
Sea-Tac Airport	75	93
Downtown Bellevue	51	58
Overlake	63	78

Source: Scheduled transit travel times from King County Metro Trip Planner, <http://metro.kingcounty.gov/>

Table 4-12 shows the southbound transit travel times during the PM peak period to regional destinations from Shoreline and Lynnwood. The travel times are only slightly faster and reflect higher variability than those described previously, which reflects the heavy traffic volumes in the I-5 corridor during the PM peak period. Southbound congestion is exacerbated when the I-5 express lanes are operating in the northbound direction.

Table 4-12. Transit Travel Times—PM Peak Period Southbound (minutes)

Destination	From Shoreline	From Lynnwood
Northgate	17	55
University of Washington	47	39
Capitol Hill	40	66
Downtown Seattle	23	35
Sea-Tac Airport	66	79
Downtown Bellevue	60	46
Overlake	58	61

Source: Scheduled transit travel times from King County Metro Trip Planner, <http://metro.kingcounty.gov/>

These transit travel times reflect the current conditions on existing bus routes (and light rail service to Sea-Tac Airport) and include wait times associated with transfers when the trip requires more than one route. All trips to and from Sea-Tac Airport are assumed to include travel by bus to downtown Seattle and a transfer to Link light rail to the airport. In addition to these travel times, the total transit trip travel time would include the time to access the bus as a pedestrian, bicyclist, passenger, or driver, as well as the wait time for the initial bus boarding. The wait time for a bus would be dependent on the service reliability (adherence to schedule). If a bus arrival is unreliable, then the riders must arrive prior to the scheduled time and wait until the bus arrives on time or late. The bus reliability is an LOS factor discussed in Section 4.2.1 above. The analysis of transfers is presented below.

Transfers

The number of transfers being made from bus-to-bus or bus-to-rail can be measured by a systemwide transfer rate, which is the average number of transit boardings per transit trip. As shown in Table 4-13, the systemwide transfer rate for the base year (2011) is 1.39. As with other systemwide measures, this transfer rate will be useful as a comparison both for future transfer rates and how transfer rates would change with the project.

Table 4-13. Transit Transfer Rate

Measure	Base Year (2011)
Transfer Rate	1.39
Total Daily (24 hours) Transit Trips	384, 200
Total Daily Transit Boardings	533,200

Source: Sound Transit Ridership Forecasting Model

Level of Service for Transit Service Frequency

Figure 4-15 presents the existing PM peak hour LOS for service frequency between selected key locations. Many pairs of destinations to and from station areas in the corridor currently operate at LOS C or better. Destination pairs with bus service frequency at LOS D or worse with travel to or from the project corridor are:

- Downtown Bellevue to north Seattle and Lynnwood Transit Center
- Downtown Seattle to 220th Street SW
- Northgate to Shoreline
- Shoreline to Northgate
- 220th Street SW to Mountlake Terrace Transit Center
- Lynnwood Transit Center to downtown Bellevue

There are also potential station areas that do not have direct bus service to or from the other potential station areas or urban centers. The trip pairs without direct bus service are:

- Downtown Bellevue to Shoreline, Mountlake Terrace Transit Center, and 220th Street SW
- Sea-Tac Airport to all station areas in the project area
- Downtown Seattle to Shoreline
- Capitol Hill to all station areas in the project area
- University District to Shoreline
- Northgate to 220th Street SW
- North Seattle to downtown Bellevue, Sea-Tac Airport, Capitol Hill, Shoreline, and 220th Street SW
- Shoreline to all station areas and urban centers, except Northgate
- Mountlake Terrace Transit Center to downtown Bellevue, Sea-Tac Airport, Capitol Hill, and Shoreline
- 220th Street SW to all station areas in the project area, except downtown Seattle and Mountlake Terrace Transit Center
- Lynnwood Transit Center to Sea-Tac Airport, Capitol Hill, Shoreline, and 220th Street SW

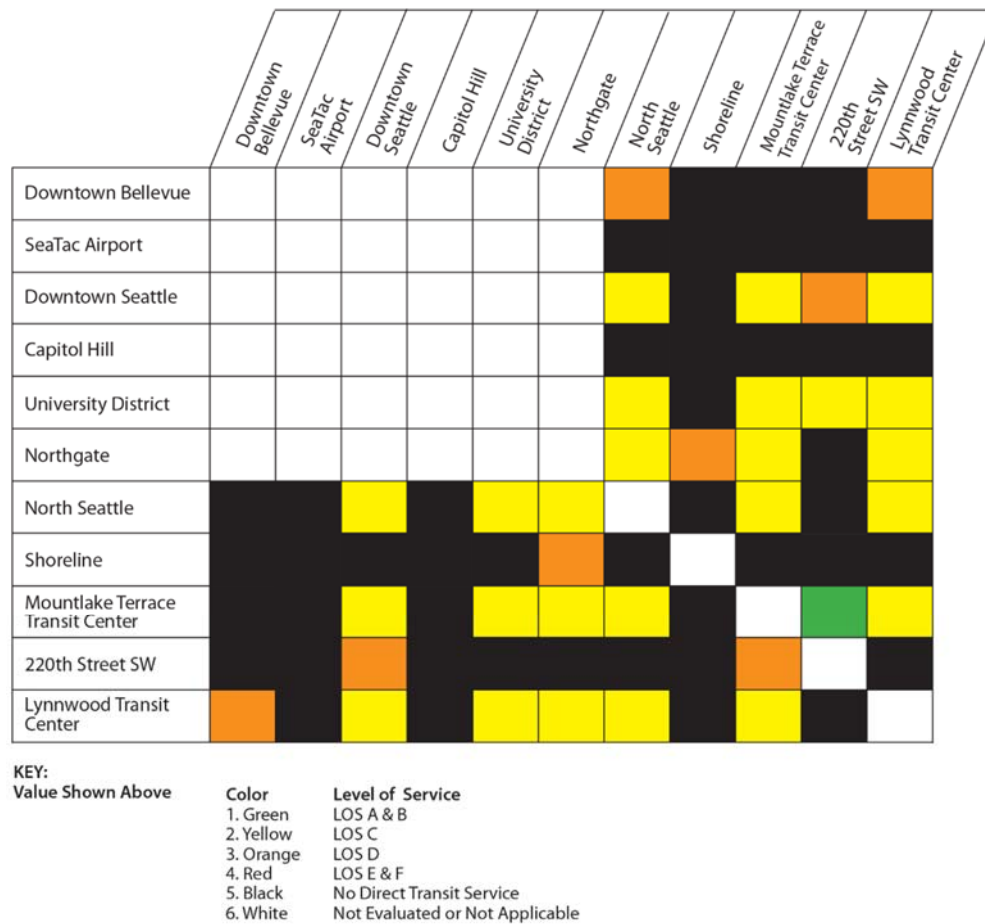


Figure 4-15. Existing PM Peak Hour Service Frequency Level of Service

Level of Service for Hours of Service

Figure 4-16 presents the LOS for hours of service for existing conditions. Hours of service LOS were evaluated between potential station areas and key regional locations. Many pairs of destinations are at LOS A or B, but none are at LOS C or D. The following are at LOS E or worse:

- Downtown Bellevue to North Seattle
- Downtown Seattle to 220th Street SW
- University District to 220th Street SW
- North Seattle to downtown Bellevue
- Shoreline to downtown Bellevue
- Mountlake Terrace Transit Center to 220th Street SW
- 220th Street SW to Mountlake Terrace Transit Center

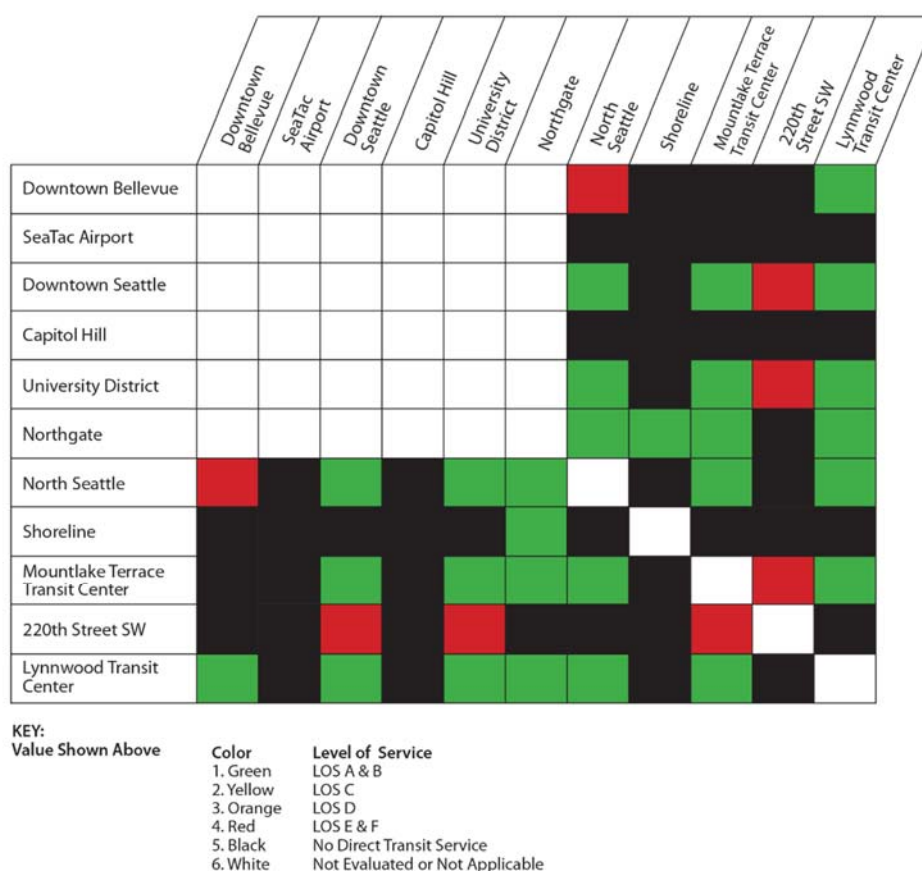


Figure 4-16. Existing Hours of Service Level of Service

Level of Service for Passenger Load

Passenger load data were available for Sound Transit Express and King County Metro transit routes. While reliable data for Community Transit routes were not readily available, the data shown for other operators are indicative of operating conditions in the corridor. Load factors were evaluated at three screenlines. The screenlines are used in the analysis to capture all north-south trips across an imaginary east-west line. The load factor represents the number of riders relative to the total number of seats available. The load factor will vary depending on the quantity of service provided. When buses are overloaded, the transit agency may restructure routes or add service to reduce overcrowding. For example, as ridership increased following the opening of the Mountlake Terrace Freeway Station in 2011, service on two Sound Transit Express routes was increased in February 2012 to relieve overcrowding.

Table 4-14 shows PM peak period passenger load factors and the corresponding LOS on bus routes traveling on I-5, SR 99, and other north-south facilities shown on the three screenlines. The load factor is at LOS A or LOS B at each screenline.

Table 4-14. PM Peak Period Load Factors

Location and Direction	Average Passengers per Seat ^a	LOS
<i>Screenline 1: North of NE Northgate Way</i>		
Northbound	0.54	B
Southbound	0.28	A
<i>Screenline 2: South of 205th Street</i>		
Northbound	0.59	B
Southbound	0.21	A
<i>Screenline 3: North of 212th Street SW</i>		
Northbound	0.58	B
Southbound	0.23	A

^a Based on 58 seats per bus.

Source: Sound Transit Ridership Model, 2011

Table 4-15 shows passenger load factors and the corresponding LOS for the AM and PM peak periods on King County Metro bus routes on I-5 at NE Northgate Way. The load factor LOS is A or B, meaning that all passengers have a seat on the bus. Note that the passenger data collection methods do not necessarily capture the number of passengers on a given bus at every location, at every time of day, or the peak load along a given route.

Table 4-15. AM and PM Peak Period Load Factors—King County Metro Routes, I-5 at NE Northgate Way

Direction	Average Passengers per Seat ^a	LOS
<i>AM Peak Period</i>		
Northbound	0.11	A
Southbound	0.62	B
<i>PM Peak Period</i>		
Northbound	0.45	A
Southbound	0.17	A

^a Based on 58 seats per bus.

Source: King County Metro, Fall 2011

Level of Service for Reliability and On-time Performance

Table 4-16 shows on-time performance and the corresponding LOS for all-day service provided by Sound Transit Regional Express routes serving the Lynnwood Link Extension corridor. On-time is defined as 0 to 5 minutes late from the scheduled time. These Sound Transit Regional Express routes operate at LOS B and

LOS C averaged across the entire day. With an on-time percentage of 90 percent, this means that 10 percent of the trips on that route are at least 5 minutes late.

Table 4-16. On-Time Performance—Sound Transit Regional Express Routes

Route	On-Time Percentage	LOS
510	87.4%	C
511	90.0%	B
512	92.7%	B
513	85.3%	C

Source: Sound Transit, June 2012 Monthly Report

4.2.3 Local and Sub-Regional Transit

The affected environment for local transit is presented by the proposed station area. A few routes that travel within the corridor segment, but do not travel in the vicinity of a station area, are presented under the segment summary.

Segment A: Seattle to Shoreline

Two local King County Metro bus routes operate within Segment A but not in the vicinity of a station area. Route 41 operates between downtown Seattle and Lake City. This route uses I-5 between downtown Seattle and the Northgate Transit Center, travels on 5th Avenue NE to NE 125th Street, and then to Lake City. Route 301 operates between downtown Seattle and Firdale Avenue/North 195th Street in Shoreline. Route 301 operates on I-5 with a stop at the NE 145th Street flyer stop and then uses the NE 175th Street interchange to and from Firdale Avenue/North 195th Street.

There are two small park-and-ride lots in Segment A, in addition to the park-and-ride stalls at the Northgate Transit Center. The NE 133rd/5th Avenue NE Park-and-Ride lot at 5th Avenue NE and NE 133rd Street is approximately 1,000 feet north of NE 130th Street and has 46 parking stalls. The North Jackson Park Park-and-Ride lot is approximately 500 feet north of NE 145th Street with 68 parking stalls.

NE 130th Street/I-5 Area

Two local King County Metro bus routes operate within the NE 130th Street/I-5 area and link the Eastside to north Seattle. Route 242 operates between the Overlake Park-and-Ride in Redmond to NE 165th Street in Seattle's Ridgecrest neighborhood. Route 242 travels on 5th Avenue NE between the Northgate Transit Center and NE 165th Street, with stops at NE 130th Street and NE 145th Street.

There are three King County Metro 900 series, Dial-a-Ride routes that operate between the Lakeside School and the South Kirkland Park-and-Ride, Seward Park neighborhood, and Laurelhurst neighborhood. Routes 986 and 987 operate on

Roosevelt Way and NE 130th Street, crossing over I-5. Route 995 operates on 5th Avenue NE, NE 130th Street, and NE 145th Street.

NE 145th Street/I-5 Area

King County Metro Route 242 described above include stops in the NE 145th Street area.

In addition to other King County Metro routes, Routes 301 and 303 travel between downtown Seattle/First Hill and north Seattle neighborhoods using the NE 145th Street freeway flyer stop and exiting I-5 at the 175th Street interchange. Route 304 operates between downtown Seattle using I-5 and the NE 145th Street interchange to travel west and serve the Shoreline and Richmond Beach areas. Route 308 uses I-5 between downtown Seattle and the NE 145th Street interchange to travel east towards Lake City and the Horizon View neighborhoods.

King County Metro Route 347 travels on 15th Avenue NE, NE 145th Street, 5th Avenue NE, and NE 175th Street to North City, Ballinger Terrace, and the Mountlake Terrace Transit Center. Route 373 is a local route operating between the University of Washington and Aurora Village along 15th Avenue NE, with a stop at NE 145th Street.

NE 155th Street/I-5 Area

King County Metro Route 330 operates between Lake City and Shoreline Community College traveling on NE 155th Street.

NE 185th Street/I-5 Area

King County Metro Route 348 operates between Northgate and the Richmond Beach neighborhood, traveling on 15th Avenue NE, NE 175th Street, 5th Avenue NE, and then west on NE 185th Street over I-5.

Segment B: Shoreline to Mountlake Terrace

The local bus routes within Segment B access the Mountlake Terrace Transit Center, or are in the vicinity of the 220th Street SW area. These local bus routes are described by station area below. The Mountlake Terrace Transit Center has 880 park-and-ride stalls, bicycle lockers, two bus bays for local routes, and two bus stops on 236th Street SW.

Mountlake Terrace Transit Center Area

Five Community Transit routes (111, 112, 119, 810, and 871) use Bus Bays 1 and 2 within the transit center. Two Community Transit routes operate between the Mountlake Terrace Transit Center and the Edmonds multimodal station. Route 130 uses bus stops on 236th Street SW, operating between the Lynnwood Transit Center

and the Edmonds multimodal station. Route 130 travels on Lakeview Drive toward Edmonds.

Two Community Transit routes connect the Mountlake Terrace and Ash Way Park-and-Ride lots. Route 112 operates between the Mountlake Terrace Transit Center, the Lynnwood Transit Center, and Ash Way Park-and-Ride traveling on 236th Street SW to the east. Route 119 operates between the Mountlake Terrace Transit Center and the Ash Way Park-and-Ride traveling on 236th Street SW, 56th Avenue West, over I-5 on 228th Street SW, then on 66th Avenue West and 220th Street SW.

Community Transit Routes 810 and 871 provide service to the University of Washington. These routes access I-5 from the 236th Street SW interchange.

Community Transit Route 111 operates between the Mountlake Terrace Transit Center and Brier east of I-5. King County Metro Route 347 from Northgate also enters the transit center to access the bus bays. From 15th Avenue NE, Route 347 travels on NE 205th Street, 48th Avenue West, and 236th Street SW to the transit center.

220th Street SW/I-5 Area

Community Transit Route 119 described above operates along 220th Street SW.

Segment C: Mountlake Terrace to Lynnwood

The local bus routes within Segment C use the Lynnwood Transit Center, which is described below. The Lynnwood Transit Center has 1,370 park-and-ride stalls, bicycle lockers, and 20 bus bays.

Lynnwood Transit Center Area

The local Community Transit routes provide connections between Community Transit park-and-rides throughout Snohomish County. The local routes access the Lynnwood Transit Center on 200th Street SW and then circulate on 48th Avenue West and 46th Avenue West to enter and exit the transit center. Route 112 travels on 44th Avenue West with bus stops on this street.

Route 115 connects the Aurora Village Transit Center, Edmonds Park-and-Ride, Edmonds Community College Transit Center, Lynnwood Transit Center, Swamp Creek Park-and-Ride, Ash Way Park-and-Ride, McCollum Park Park-and-Ride, and the Mariner Park-and-Ride. Route 116 connects the Edmonds multimodal station to Mill Creek, traveling through the Lynnwood, Swamp Creek, and Ash Way Park-and-Rides. Route 120 connects the Lynnwood Transit Center to the Canyon Park Park-and-Ride in Bothell. Route 130 connects the Edmonds multimodal station, Aurora Village Transit Center, Mountlake Terrace Transit Center, and the Lynnwood Transit Center. Route 130 travels on 52nd Avenue West to 200th Street SW and into the Lynnwood Transit Center. Routes 201 and 202 connect the Lynnwood Transit

Center to park-and-rides to the north and then the Everett multimodal station and Smokey Point in Arlington. Route 196 travels between the Edmonds multimodal station to Alderwood Mall Parkway/184th Street SW, along 196th Street SW north of the Lynnwood Transit Center.

4.3 Freeway Operations

This section discusses current I-5 freeway traffic operations from the NE 130th Street interchange to the City of Lynnwood interchange areas. Key observations and findings after analysis of the existing freeway operations include the following:

- During the AM peak hour, average speeds on southbound I-5 (the peak direction of travel) range from 24 mph to 58 mph, with noticeable congestion (defined as LOS E or F) from SR 104 to the NE 130th Street interchange area. In the northbound direction, speeds are estimated at approximately 55 mph with operations at LOS B or C.
- During the PM peak hour, average speeds on northbound I-5 from NE 130th Street to the City of Lynnwood interchange areas range from 18 mph to 51 mph, with noticeable congestion (LOS E or F) throughout the study area. In the southbound direction, modeled speeds range from 45 mph to 58 mph with operating conditions generally at LOS C or D; however, congestion is typically encountered from the Northgate area southbound through downtown Seattle based on known conditions and field observations. This southbound congestion is known to frequently extend north of the Northgate area into Shoreline. However, due to the limits of the study area, such spillback effects, vehicle queuing from a congestion point that extends beyond the next interchange or intersection, are not explicitly reflected in the model used for this analysis.

4.3.1 Evaluation Methodology

Existing freeway conditions were evaluated using VISSIM analysis software—a widely accepted traffic micro-simulation tool. VISSIM assesses the roadway network stochastically (i.e. estimating flow conditions based on probability and randomness) in which the movement of individual vehicles within a traffic stream are represented as they respond to the influences and operating behaviors of other vehicles. Performance measures reported from the VISSIM simulation analysis include travel times, mainline speeds, vehicle throughput, and LOS. An I-5 VISSIM model was developed to analyze the study corridor from the NE 130th Street/I-5 interchange to the City of Lynnwood interchanges with I-5.

To establish a baseline foundation for comparing future no build and build scenarios, an existing conditions model was developed for the AM and PM peak hours, 7 to 8 AM and 5 to 6 PM, respectively. In addition to modeling the freeway ramps at the study area interchanges, 27 arterial intersections were represented in the model to capture interactions between freeway and arterial traffic operations. These

interactions included queuing activity and spill-back effects within the NE 130th Street and NE 145th Street interchange areas and the Lynnwood Transit Center Station area.

A supporting Synchro analysis model was used for analyzing and reporting traffic conditions for peripheral intersections (outside of the interchange areas) not covered in the VISSIM analysis. Refer to Section 4.4.1 for the results of the intersection analysis. The intersections incorporated in the VISSIM model are listed below.

Study Intersections

NE 130th Street Interchange Area

- 5th Avenue NE at NE 127th Street (PM peak hour only)
- 5th Avenue NE at the I-5 northbound off-ramp south of NE 130th Street (AM and PM peak hours)
- 5th Avenue NE at NE 130th Street/Roosevelt Way NE (AM and PM peak hours)
- I-5 southbound on-ramp at NE 130th Street (AM and PM peak hours)
- 3rd Avenue NE at NE 130th Street (PM peak hour only)
- 1st Avenue NE at NE 130th Street (AM and PM peak hours)

NE 145th Street Interchange Area

- 5th Avenue NE at the I-5 northbound off-ramp south of NE 145th Street (AM and PM peak hours)
- 5th Avenue NE at the I-5 northbound on-ramp (AM and PM peak hours)
- 5th Avenue NE at North Jackson Park-and-Ride access drive (AM and PM peak hours)
- I-5 southbound on-ramp and off-ramp at NE 145th Street (AM and PM peak hours)
- 4th Avenue NE at NE 145th Street (PM peak hour only)
- 3rd Avenue NE at NE 145th Street (PM peak hour only)
- 1st Avenue NE at NE 145th Street (PM peak hour only)

City of Lynnwood Transit Center Station Area

- 196th Street SW at 50th Avenue West (AM and PM peak hours)
- 196th Street SW at 48th Avenue West (PM peak hour only)
- 196th Street SW at 44th Avenue West (AM and PM peak hours)
- 196th Street SW at 40th Avenue West (PM peak hour only)
- 196th Street SW at 36th Avenue West/I-5 Southbound Ramps (AM and PM peak hours)
- 196th Street SW at Poplar Way (AM and PM peak hours)
- Alderwood Mall Parkway/I-5 Northbound Ramps and Poplar Way (AM and PM peak hours)
- 198th Street SW at 44th Avenue West (PM peak hour only)
- 198th Street SW at 40th Avenue West (PM peak hour only)
- 200th Street SW at 50th Avenue West (AM and PM peak hours)
- 200th Street SW at 48th Avenue West (AM and PM peak hours)
- 200th Street SW at 46th Avenue West (AM and PM peak hours)
- 200th Street SW at 44th Avenue West (AM and PM peak hours)
- Alderwood Mall Boulevard and 40th Avenue West (PM peak hour only)

To capture potential operational impacts of the project to the freeway system, the VISSIM model framework was developed to include the interchanges beyond the corridor limits on each side of the project. As such, it extends from the interchange at NE Northgate Way on the south end of the corridor, to south of the I-405/I-5 interchange in Lynnwood on the north end.

I-5 north of NE Northgate Way generally consists of four general purpose lanes and an inside HOV lane in each direction. The HOV lane extends throughout the entire length of I-5 in the study area. The freeway interchanges analyzed are described from south to north below.

The NE 130th Street interchange includes I-5 ramps to and from the south only. The northbound exit ramp lane to NE 130th Street is a drop lane and intersects 5th Avenue NE south of NE 130th Street. The ramp intersection with 5th Avenue NE is controlled by a stop sign for the off-ramp only. The neighboring interchange to the north is NE 145th Street/SR 523.

The NE 145th Street interchange is a full movement facility with I-5 on-ramp and off-ramp access provided in both the northbound and southbound directions. Both sets of ramps include special purpose lanes for buses to access freeway flyer stop facilities. 5th Avenue NE crosses the northbound off-ramp south of NE 145th Street

with both directions of 5th Avenue NE controlled by stop signs. The northbound bus off-ramp intersects 5th Avenue NE north of NE 145th Street. The northbound on-ramp begins at this same intersection location. Northbound vehicles on NE 145th Street travel northbound on 5th Avenue NE to access the northbound ramp.

North of NE 155th Street, northbound and southbound on-ramps and off-ramps provide access for only bus maintenance vehicles.

A full diamond interchange exists at NE 175th Street with a drop-lane and an add lane for the northbound off-ramps and on-ramps, respectively. The southbound ramps reflect merge and diverge conditions.

The SR 104/I-5 interchange is full access along with collector/distributor lanes in both directions. This interchange is closely spaced with the 236th Street SW interchange, which has access to and from the south only, and a freeway median flyer bus stop that is accessed from the center HOV lanes at the Mountlake Terrace Transit Center. The SR 104 ramps to and from the north access I-5 north of 236th Street SW.

The 220th Street SW interchange is a full movement diamond interchange with an add lane for the northbound on-ramp to I-5.

The City of Lynnwood lies at the north end of the study corridor. There are several ramps connecting I-5 to Lynnwood in both the northbound and southbound directions. From 44th Street SW, I-5 ramps are provided to and from the south. Along with surface street access to the Lynnwood station, an HOV/transit direct access ramp is also provided connecting to and from the I-5 northbound and southbound HOV lanes. In addition, there are ramps to and from 196th Street SW and Poplar Way that are just south of the I-405/I-5 interchange.

4.3.2 Freeway Volumes

Existing traffic volumes on I-5 ramps were compiled from the WSDOT 2010 Ramp and Roadway count database and balanced along the I-5 study corridor. The existing conditions VISSIM model was calibrated to replicate observed traffic counts (peak period mainline volumes) generally within a 5 percent (+/-) deviation range. Figures 4-17 to 4-19 show the I-5 traffic volumes for the AM and PM peak hours.

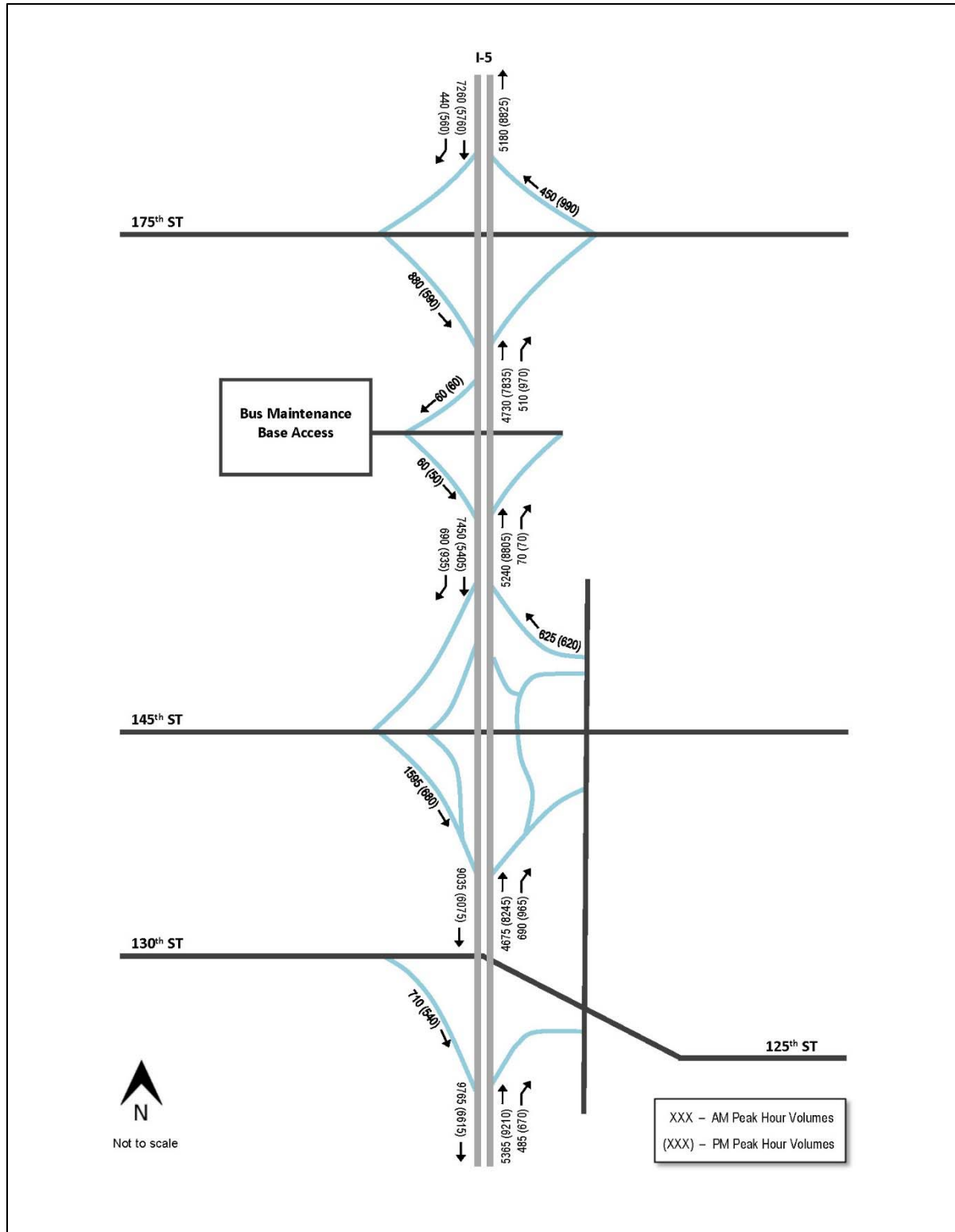


Figure 4-17. Freeway Mainline and Ramp Volumes (Segment A)—Existing Conditions AM and PM Peak Hour

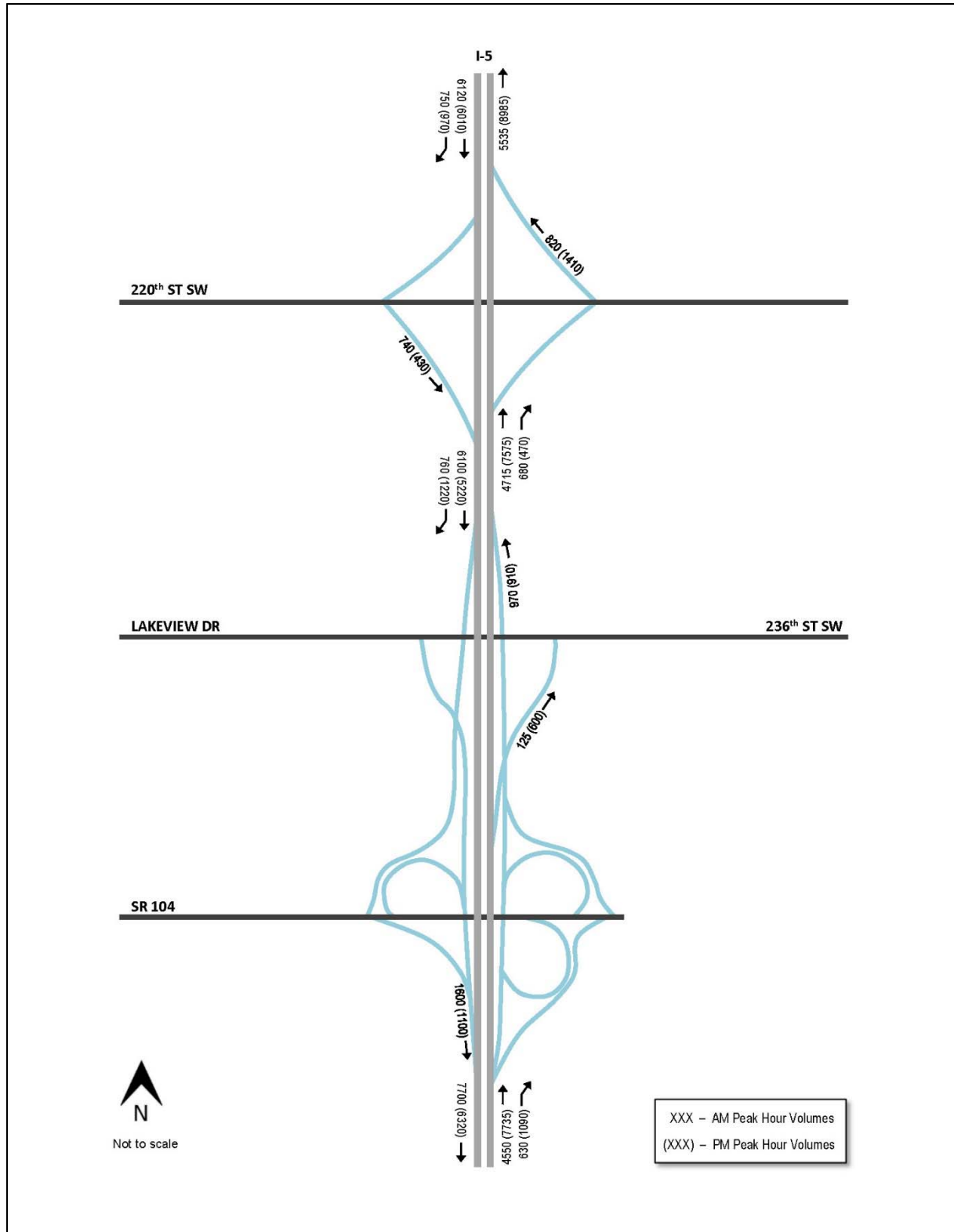


Figure 4-18. Freeway Mainline and Ramp Volumes (Segment B)—Existing Conditions AM and PM Peak Hour

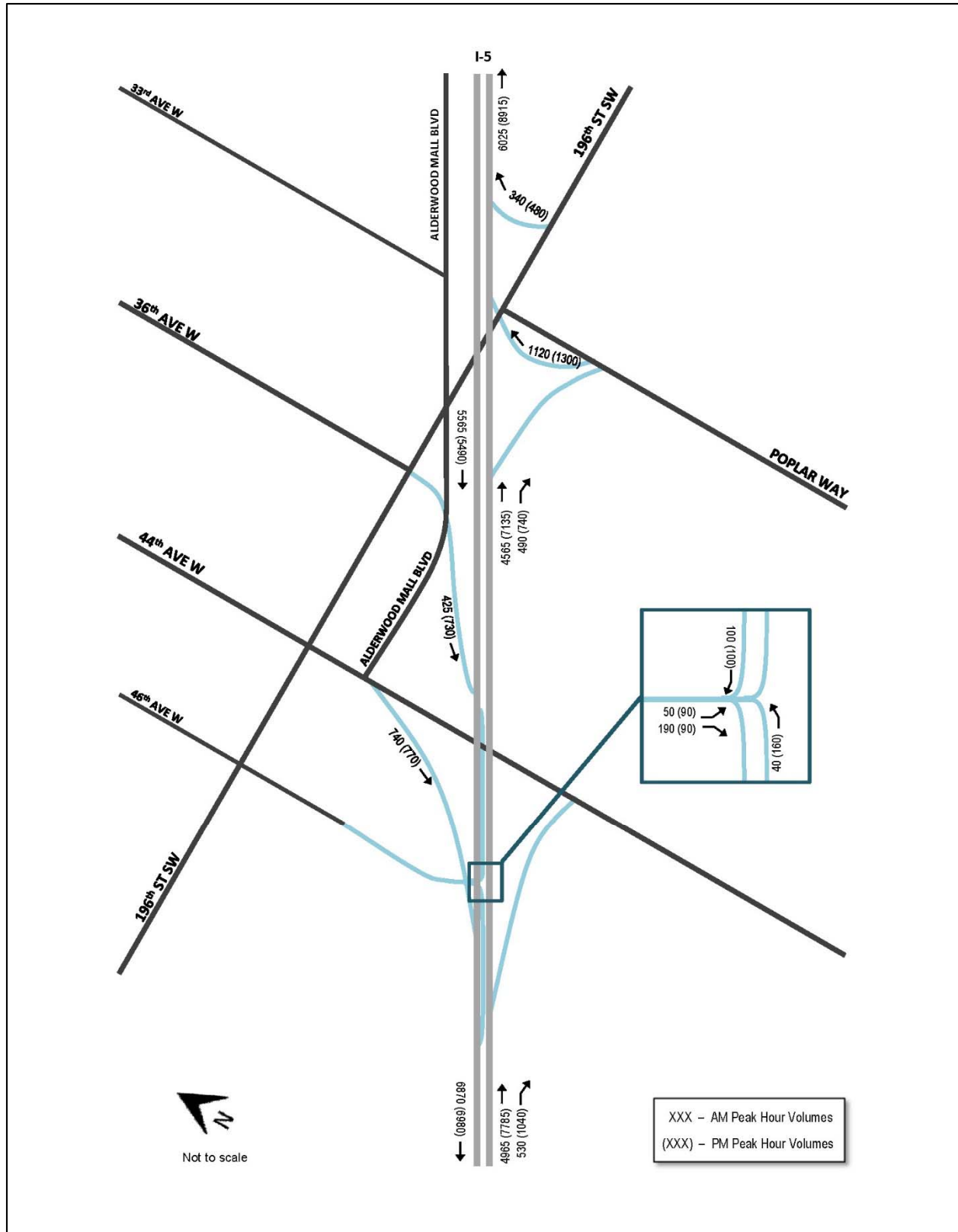


Figure 4-19. Freeway Mainline and Ramp Volumes (Segment C)—Existing Conditions AM and PM Peak Hour

4.3.3 Freeway Speeds and Level of Service

Current freeway mainline speeds were obtained from existing WSDOT traffic flow monitoring data and were used to calibrate the simulation model in order to accurately represent operating conditions on I-5 near the NE 130th Street and NE 145th Street interchanges (where ramp modifications are proposed with the light rail alternatives). Figures 4-20 to 4-22 show the modeled freeway speeds and LOS for existing conditions in the AM and PM peak hours along the study area. North of NE 145th Street, the model was calibrated at a more cursory level based on aggregate volume throughput.

In the AM peak hour, average speeds currently along southbound I-5, the peak direction of travel, are estimated to range from 24 mph to 58 mph. For northbound I-5, the off-peak direction speeds are approximately 55 mph. The LOS results from the model simulation and analysis indicate that southbound I-5 is operating under very congested conditions in the AM peak hour (LOS E or F) within this freeway segment. This congestion is largely due to high volumes of merging traffic at NE 130th Street, NE 145th Street, NE 175th Street, and SR 104, as well as merging and weaving activity farther south. Operating conditions for the northbound direction are in the LOS B to C range, indicating that speeds and flow characteristics are generally acceptable.

In the PM peak hour, average speeds along northbound I-5 (peak direction) range from 18 mph to 51 mph. Southbound I-5 average speeds range from 45 mph to 58 mph through the NE 130th Street interchange. The LOS results indicate that northbound I-5 is operating under highly congested conditions at LOS E or F within this study area. This congestion is mainly due to high volumes of merging and weaving traffic at each of the study interchanges along the broader I-5 study corridor. One example of heavy merging and weaving ramp activity is the NE 130th Street interchange area where the northbound stop-controlled off-ramp and upstream weave section causes backups on the northbound I-5 mainline.

Southbound I-5 traffic flow conditions range from LOS C to E within this study segment, indicating that operations are generally acceptable but with some sections of slow-moving traffic. Southbound traffic conditions near the NE 145th Street interchange are one such example of heavy congestion. Backups in this area are caused by heavy volumes exiting at NE 145th Street, causing delays and some spill-back onto the freeway. Also, while not explicitly analyzed, south of the NE 130th Street and Northgate interchanges, traffic flow on I-5 is typically constrained in the PM peak hour due to congestion caused by a variety of factors including merging and weaving activity, lane configuration, and capacity constraints, etc. This segment of I-5 can often be congested into downtown Seattle and extending into areas farther south.

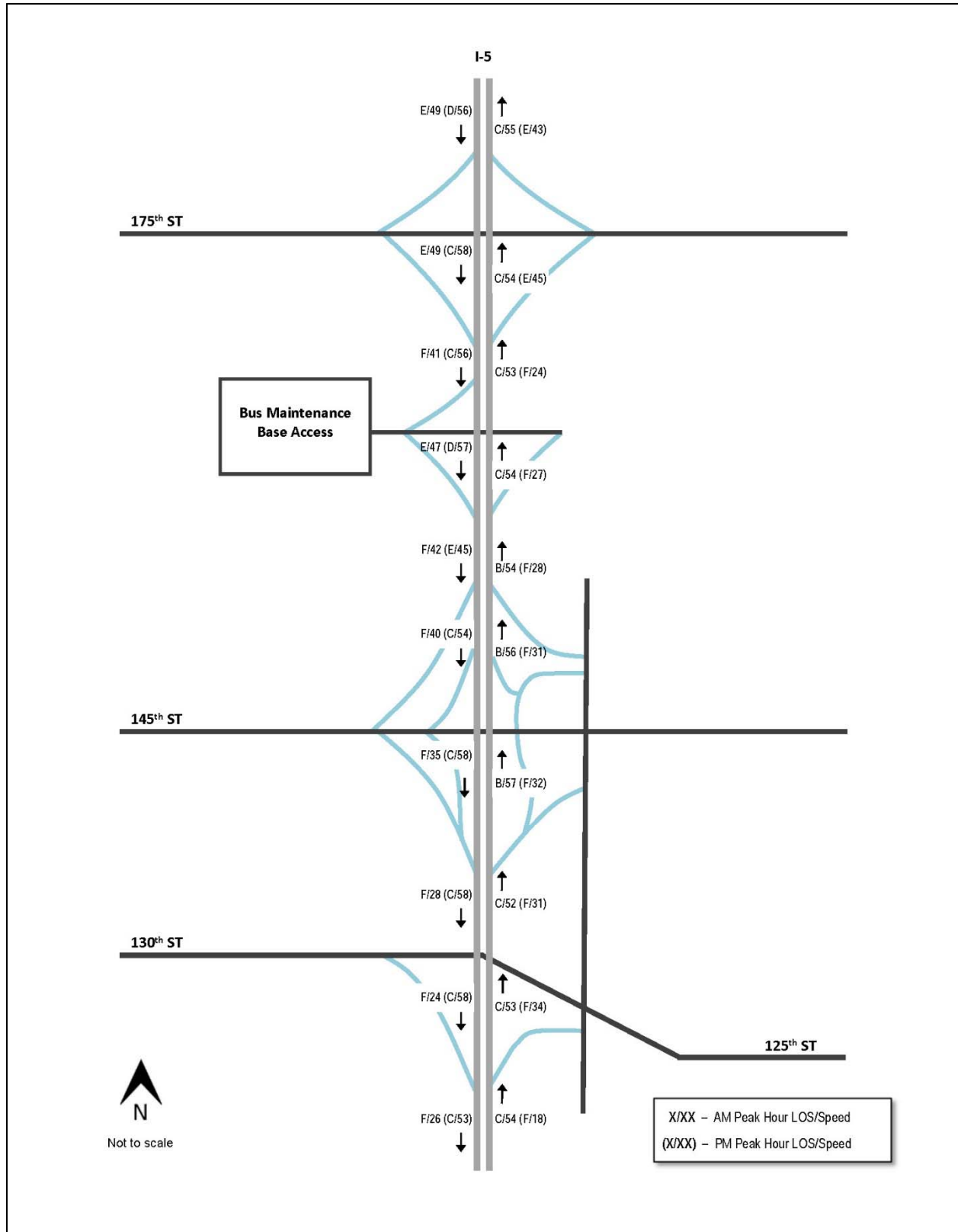


Figure 4-20. Freeway LOS and Speeds (Segment A)—Existing Conditions AM and PM Peak Hour

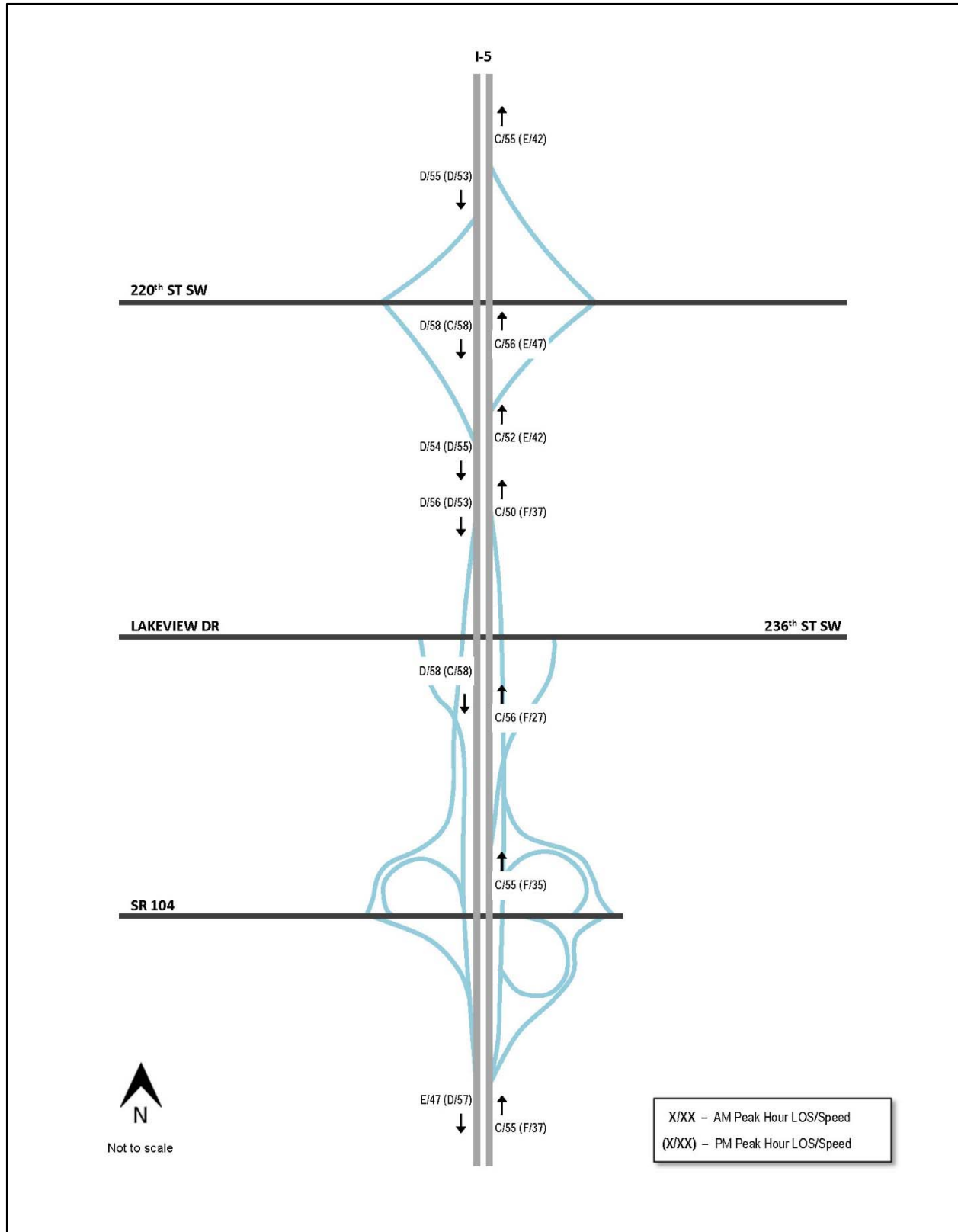


Figure 4-21. Freeway LOS and Speeds (Segment B)—Existing Conditions AM and PM Peak Hour

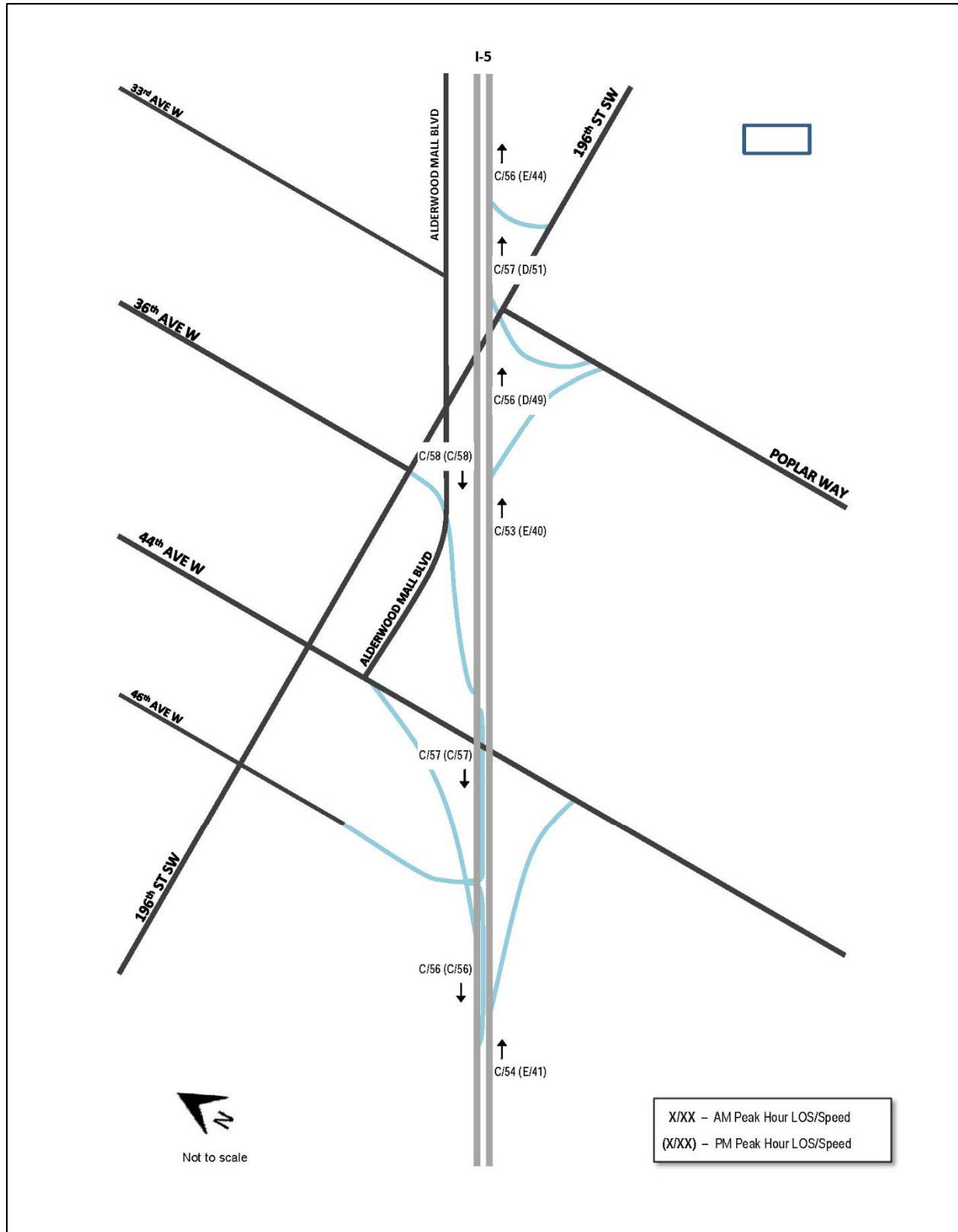


Figure 4-22. Freeway LOS and Speeds (Segment C)—Existing Conditions AM and PM Peak Hour

4.4 Arterials and Local Streets

This section describes current operational conditions for the arterial and local street network within the project area. Key observations and findings include the following:

- Intersections near each proposed light rail station were analyzed to determine whether they are currently operating at acceptable levels or failing according to the governing jurisdiction's intersection LOS standard. In Segment A, the City of Shoreline arterial segments were also evaluated to ensure consistency with the City's concurrency standards.
- In Segment A, 7 out of the 69 intersections evaluated in Seattle and Shoreline for intersection LOS currently do not meet agency standards for acceptable operations during the AM and/or PM peak hour. These intersections are located along 1st Avenue near Northgate, I-5/NE 130th Street and I-5/NE 145th Street interchanges, along NE 145th Street, and on Aurora Avenue North. In addition, one northbound arterial segment currently does not meet the City of Shoreline's concurrency standard during the PM peak hour.
- In Segment B, 1 intersection out of the 19 intersections analyzed within the City of Mountlake Terrace, located near the existing Mountlake Terrace Transit Center, currently operates below standards during the AM peak hour.
- In Segment C, all 20 of the intersections evaluated for intersection LOS currently meet the City of Lynnwood LOS standards.

4.4.1 Traffic Operations

The arterial and local street analysis involved locations most likely to be affected by the project alternatives. The evaluation also included a description of the physical characteristics of the major road facilities in each segment. These characteristics include functional classification, number of lanes, speed limits, and daily traffic volumes. The focus of the arterial and local street analysis, however, was on intersection operations in areas most directly affected, such as by a change in channelization or signal control, as well as those indirectly affected by changes in volume due to trips accessing the light rail system. The latter included intersections surrounding transit stations with proposed increases in park-and-ride capacity and passenger pick-up and drop-off activity.

Existing peak-hour turning movement counts for 2010 through 2012 were collected from WSDOT and the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood for all intersections where data were readily available. Where recent turning movement counts were not available, new counts were taken in May and June 2012. Additional information used in the operational analysis includes the roadway's functional use, lane geometry, traffic signal timing and phasing patterns, on-street parking, proximity to bus stops, and speed limits.

The quality of traffic operations is described in terms of LOS. Traffic operations were analyzed using the Transportation Research Board's *Highway Capacity Manual* methodology to calculate peak hour LOS at signalized and unsignalized intersections. Intersection results at signalized intersections are provided for the average delays of all vehicles as they approach the intersection. However, at selected intersections key movements that are operating significantly different from the overall intersection LOS are also called out. Synchro (version 7.0) software was used to analyze most of the signalized and unsignalized intersections, with the exception of intersections at the NE 130th Street and NE 145th Street interchanges between 1st Avenue NE and 5th Avenue NE, and intersections in the Lynnwood City Center. VISSIM version 5.40 software was used to analyze these intersections in order to more effectively represent queue interactions between intersections. Figure 4-21 shows the locations of all the evaluated intersections.

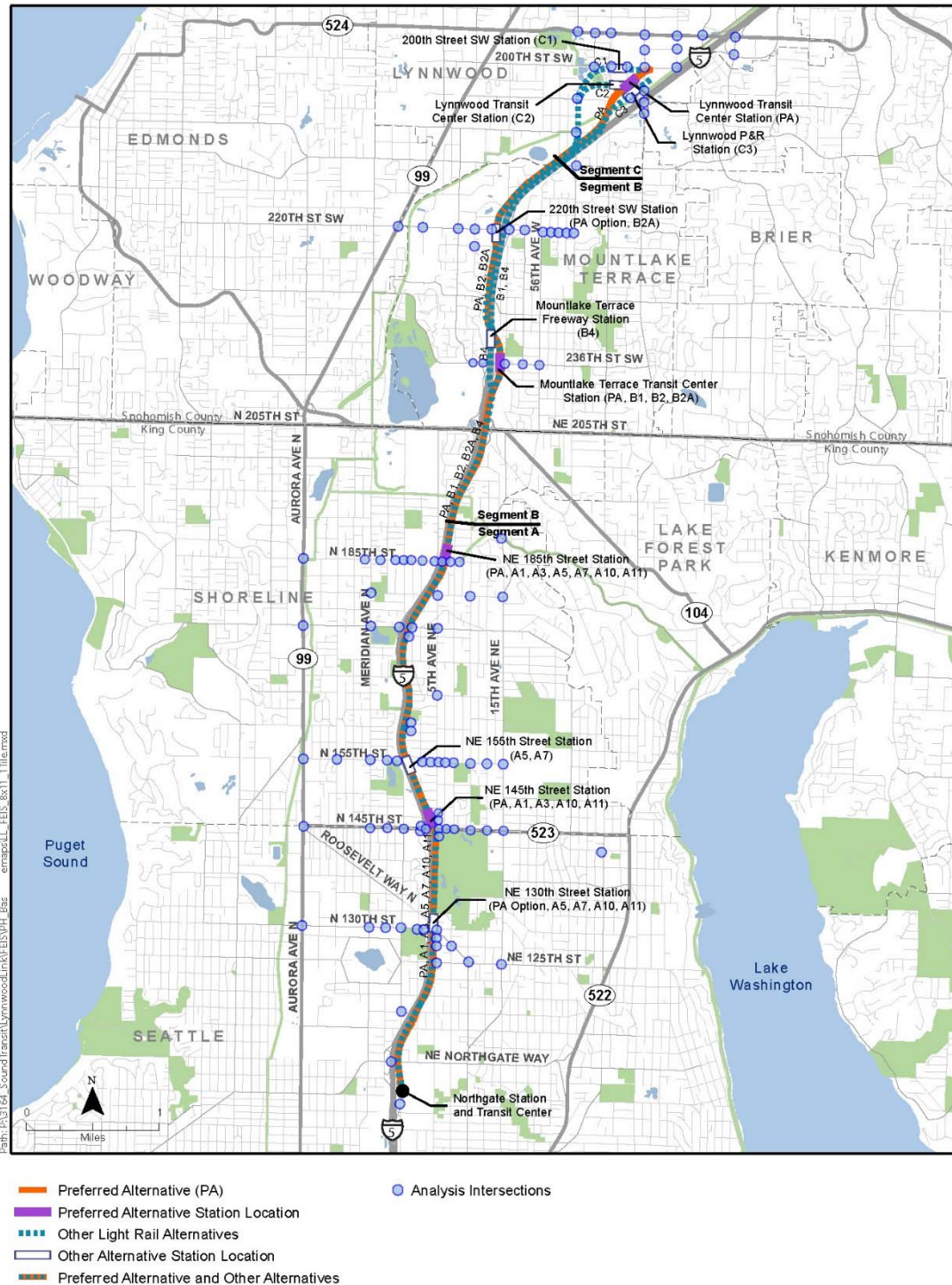


Figure 4-23. Analysis Intersections

Intersection results at unsignalized intersections are provided for the average delays for all vehicles at all-way stop-controlled intersections, and the leg that would experience the greatest delay, or worst LOS, for two-way stop-controlled intersections. LOS ratings, shown in Table 4-17, range from LOS A to LOS F; LOS A represents the best operation and LOS F the poorest operation. LOS was calculated for all study area intersections. Detailed LOS analysis reports for each intersection are provided in Appendix C.

Table 4-17. Level of Service Definitions for Signalized and Unsignalized Intersections

LOS	Average Control Delay (seconds per vehicle)		Traffic Flow Characteristics
	Signalized Intersection	Unsignalized Intersection	
A	≤ 10	≤ 10	Virtually free flow; completely unimpeded.
B	> 10 and ≤ 20	> 10 and ≤ 15	Stable flow with slight delays; less freedom to maneuver.
C	> 20 and ≤ 35	> 15 and ≤ 25	Stable flow with delays; less freedom to maneuver.
D	> 35 and ≤ 55	> 25 and ≤ 35	High density but stable flow.
E	> 55 and ≤ 80	> 35 and ≤ 50	Operating conditions at or near capacity; unstable flow.
F	> 80	> 50	Forced flow; breakdown conditions.

Source: 2010 *Highway Capacity Manual*, Transportation Research Board.

Intersections were analyzed to determine whether they are currently operating at acceptable levels or failing. Arterials within the Shoreline city limits were also analyzed to determine whether they meet City of Shoreline concurrency standards, which are intended to ensure that adequate transportation facilities will be in place as new developments occur. Intersections and arterials are considered failing when they do not operate at or better than the governing jurisdiction's performance standard. Table 4-18 summarizes the performance standards for the relevant jurisdiction.

Table 4-18. Arterials and Local Street Performance Standards in the Project Corridor

Agency	Minimum Performance Standard
WSDOT	LOS D for highways of statewide significance (HSS) LOS E/mitigated for regionally significant state highways (non-HSS)
City of Lynnwood	LOS E for city center arterials LOS D for non-city center arterials
City of Mountlake Terrace	LOS D for signalized intersections with the following exceptions (LOS E): <ul style="list-style-type: none"> • 212th Street SW • 244th Street SW • 220th Street SW between SR 99 and I-5 LOS E for unsignalized intersections

Table 4-18. Arterials and Local Street Performance Standards in the Project Corridor

Agency	Minimum Performance Standard
City of Shoreline	LOS D for signalized intersections LOS D for unsignalized intersecting arterials Volume-to-capacity ratio of 0.90 or lower for principal and minor arterials with the following exceptions: <ul style="list-style-type: none"> • 5th Avenue NE from NE 145th Street to the I-5 on-ramps; exempt from City concurrency standard • 15th Avenue NE from NE 150th Street to NE 175th Street; volume-to-capacity ratio of 1.10 or lower
City of Seattle	LOS D (goal)

Segment A: Seattle to Shoreline

Link light rail within Segment A is projected to run along the east side of I-5 from the Northgate Station (currently under construction) to a proposed station at NE 185th Street. The six alternatives considered in this segment are either at-grade with elevated sections or mostly elevated, and have intermediate stations at NE 130th Street, NE 145th Street, and NE 185th Street, or NE 130th Street and NE 155th Street. Table 4-19 lists the arterials or roadways potentially affected by the project, including classification, number of lanes, speed limit, and daily traffic volumes.

Table 4-19. Segment A Existing Roadway Facilities

Roadway	Arterial Classification	Number of Lanes	Speed Limit (mph)	Daily Traffic Volume ^a (vehicles)
I-5	Interstate	6–8	60	171,000–211,000
SR 99	Principal Arterial	4–7	30–50	28,000–34,000
SR 522/Lake City Way NE	Principal Arterial	2–5	30–35	32,000–46,000
SR 523/North 145th Street	Principal Arterial	4	35	21,000–28,000
NE Northgate Way	Principal Arterial	4	30	17,500–31,700
NE 115th Street	Collector Arterial	2	20	1,200
NE 125th Street	Principal Arterial	2–3	30	18,000
North/NE 130th Street	Principal Arterial	4	30	19,900
North/NE 155th Street	Minor Arterial	2	35	7,200–11,800
North/NE 165th Street	Local Primary Street or Collector Arterial	2	25	600–1,900
North/NE 175th Street	Principal Arterial	4	35	18,000–30,800
North/NE 185th Street	Minor Arterial	2–4	35	7,200–17,300
Ashworth Avenue North	Local Primary Street or Collector Arterial	2	25	400–1,800
Meridian Avenue North	Collector Arterial	2	35	3,900–12,100

Table 4-19. Segment A Existing Roadway Facilities

Roadway	Arterial Classification	Number of Lanes	Speed Limit (mph)	Daily Traffic Volume^a (vehicles)
1st Avenue NE	Principal/Collector Arterial	2–5	25–30	3,000–5,300
5th Avenue NE	Minor Arterial	2–4	30	3,400–19,300
Roosevelt Way North/NE	Principal/Collector Arterial	4	30	18,400
10th Avenue NE	Collector Arterial or Local Primary Street	2	30	1,300–5,000
15th Avenue NE	Principal/Minor Arterial	4	35	14,100–15,700

^a Year 2011 to 2012 daily traffic volumes are based on the latest available daily traffic count information available, including average annual daily traffic (AADT) volumes from the WSDOT Annual Traffic Report (2011), average annual weekday traffic (AAWT) volumes from 2010 Seattle Traffic Flow Map (2011), average daily traffic (ADT) counts from the Seattle Department of Transportation traffic count database (2011-2012), and average weekday daily traffic (AWDT) volumes from the Shoreline Master Plan (2011).

For Segment A, PM peak hour analysis was conducted for 31 intersections within Seattle boundaries and 38 intersections within Shoreline city limits. AM peak hour analysis was also conducted at 15 of the intersections in Seattle and 11 of the intersections in Shoreline. Existing intersection analysis results, shown in Figures 4-22 and 4-23, were compared with the relevant jurisdiction's adopted LOS standard (shown in Table 4-18) to determine whether the intersection operates at an acceptable LOS. Figures 4-22 and 4-23 are color coded to indicate where LOS standards are met or are not met. Green and yellow indicate the LOS standards are met; red indicates operations fall below LOS standards.

As shown in Figures 4-22 and 4-23, seven intersections in Segment A currently do not meet LOS standards during the PM peak hour, and two intersections do not meet LOS standards in the AM peak hour:

- 1st Avenue NE and I-5 ramps/Northgate Mall Driveway (PM peak hour)
- 1st Avenue NE and NE Northgate Way (PM peak hour)
- 5th Avenue NE and I-5 northbound off-ramp south of NE 130th Street—eastbound approach (AM and PM peak hours)
- North 130th Street and Aurora Avenue North (PM peak hour)
- NE 145th Street and Bothell Way NE/Lake City Way NE (PM peak hour)
- NE 145th Street and 12th Avenue NE—northbound approach (PM peak hour)
- 5th Avenue NE and I-5 northbound off-ramp south of NE 145th Street—northbound approach (PM peak hour)

For Shoreline, the following arterials were also evaluated for PM peak hour v/c ratios to determine whether they meet the City of Shoreline concurrency standards:

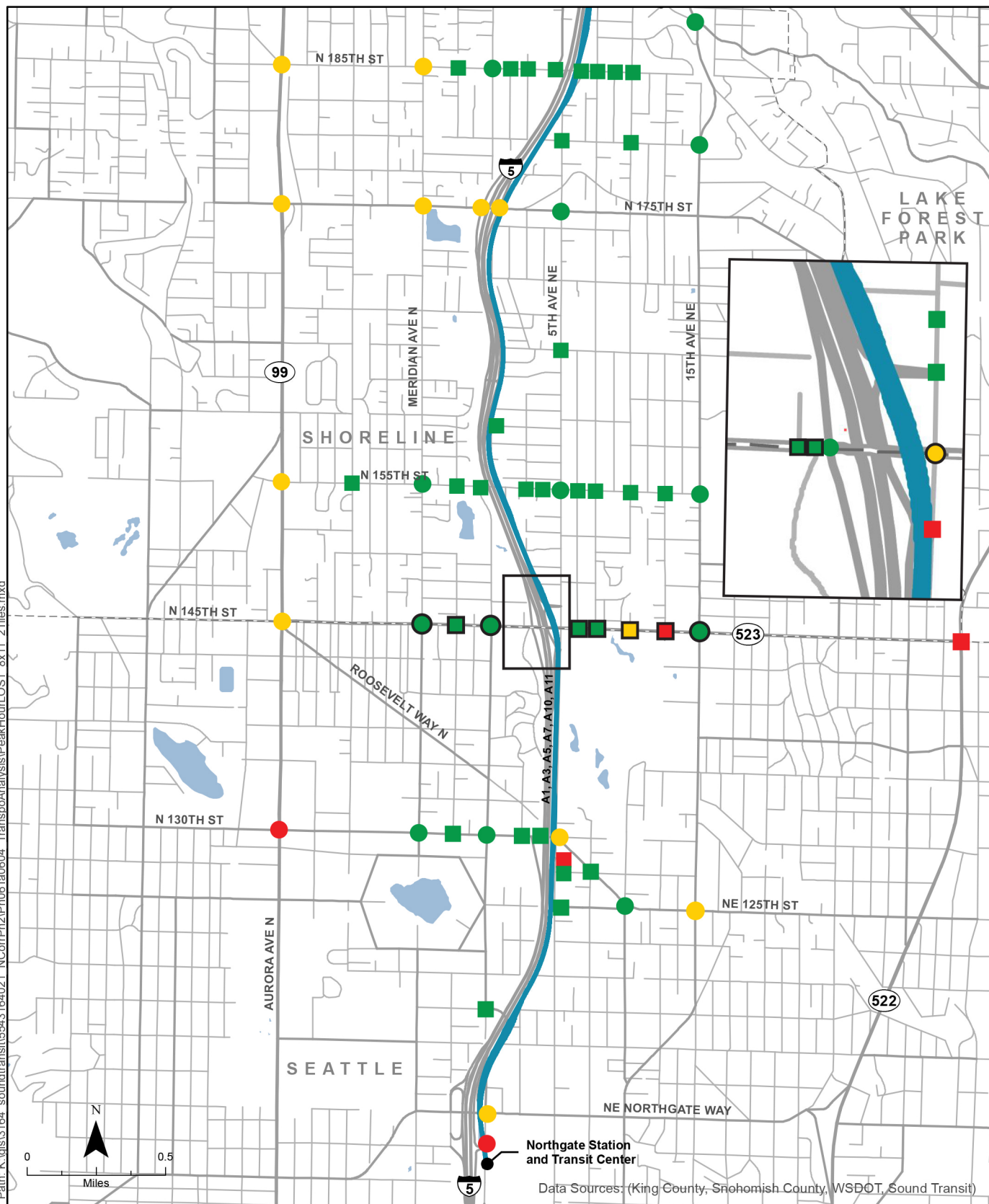
- NE 155th Street—Westminster Way North to 15th Avenue NE
- NE 185th Street—Aurora Avenue North to 10th Avenue NE
- 5th Avenue NE/7th Avenue NE—NE 145th Street to NE 185th Street
- Meridian Avenue North—North 145th Street to North 205th Street
- 15th Avenue NE—NE 145th Street to NE 205th Street
- NE 175th Street—Aurora Avenue North to 15th Avenue NE

The v/c ratio ranges for these arterials are shown in Figure 4-24. The majority of these arterials were compared with the City's v/c standard of 0.90 or lower for principal and minor arterials. Exceptions to the 0.90 standard include 5th Avenue NE from NE 145th Street to the I-5 on-ramps, which is exempt from the City concurrency standards, and 15th Avenue NE between NE 150th Street and NE 175th Street, which has a v/c standard of 1.10. In Figure 4-24, green and yellow indicate that the v/c ratio is within the City of Shoreline's v/c standard of 0.90; red indicates that the arterial v/c ratio falls below 0.90.

As shown in Figure 4-24, the following arterial segments currently have v/c ratios that are higher than 0.90 during the PM peak hour:

- Meridian Avenue North from North 175th Street to North 185th Street—northbound (does not meet concurrency standard)
- 5th Avenue NE north of North 145th Street—northbound (exempt from concurrency)
- 15th Avenue NE south of NE 155th Street—northbound (v/c is below 1.10, does not exceed concurrency standard)

Path: K:\gis\3164_soundtransit\5543164021_NCorrPh2\Ph06Ta0604_TranspoAnalysis\PeakHour\OS1_8x11_2Tiles.mxd



Data Sources: (King County, Snohomish County, WSDOT, Sound Transit)

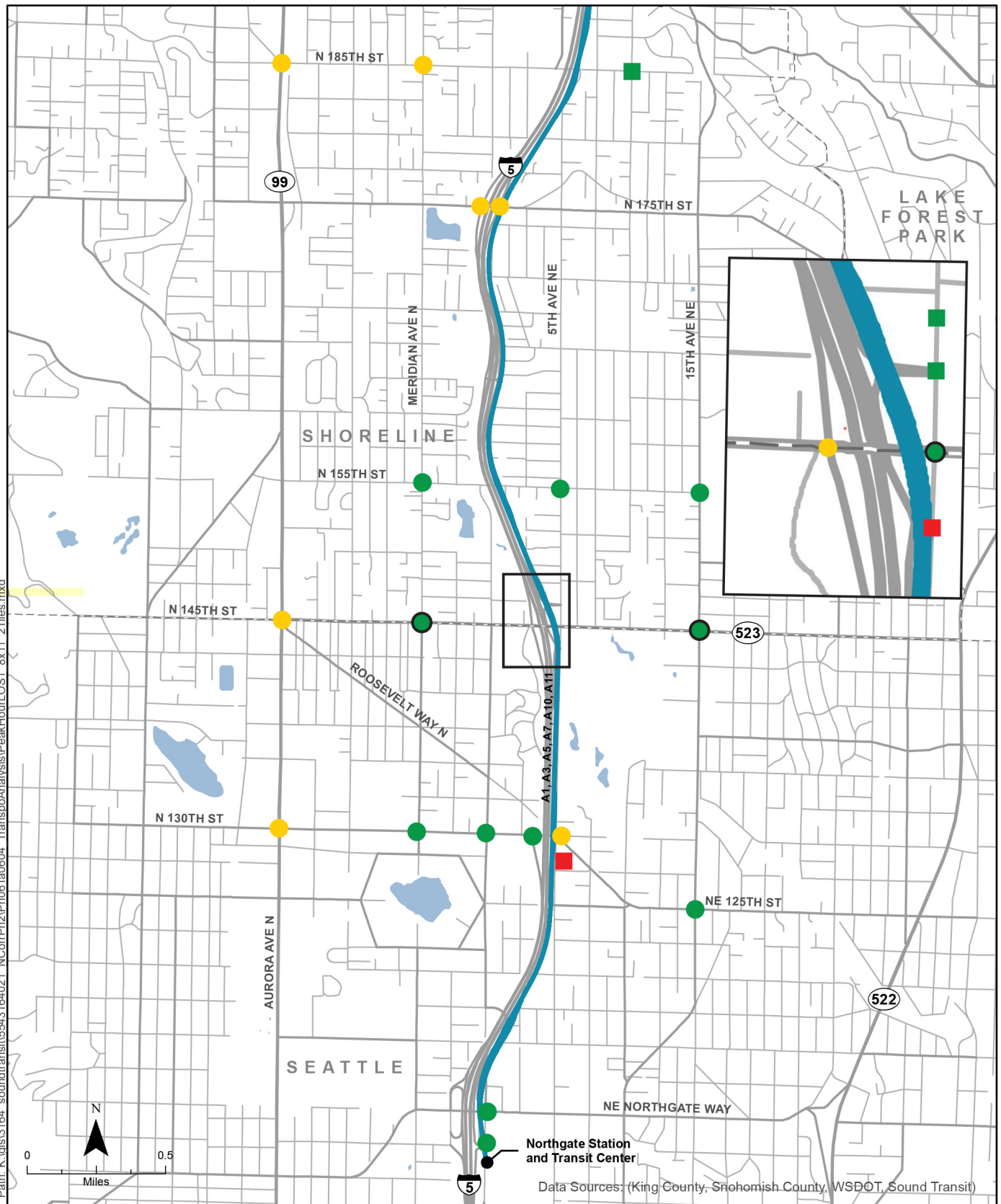
Legend

- Light Rail Alternatives
- Intersection Level of Service**
- Seattle, Shoreline & WSDOT HSS¹
 - A-C
 - D
 - E-F
- WSDOT non-HSS¹
 - A-D
 - E
 - F
- Intersection Type**
 - Signalized
 - Two-Way Stop Controlled
 - A All-Way Stop Controlled

¹HSS = Highways of statewide significance

Figure 4-24
Existing PM Peak Hour
Intersection LOS - Segment A

Path: K:\gis\3164_soundtransit\5543164021_NCorrPh2\Ph06Ta0604_TranspoAnalysis\PeakHour\OS1_8x11_2Tiles.mxd



Legend

Light Rail Alternatives

Intersection Level of Service

Seattle, Shoreline & WSDOT HSS¹

Green circle: A-C
Yellow circle: D
Red circle: E-F

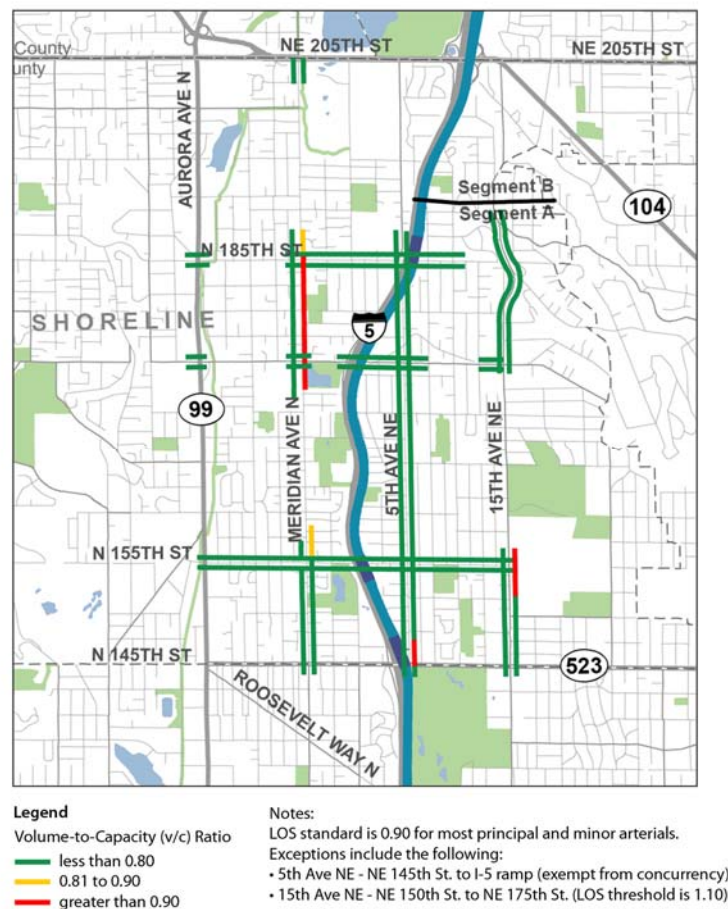
WSDOT non-HSS¹
Green circle: A-D
Yellow circle: E
Red circle: F

¹HSS = Highways of statewide significance

Intersection Type

Circle: Signalized
Square: Two-Way Stop Controlled
Square with 'A': All-Way Stop Controlled

Figure 4-25
Existing AM Peak Hour
Intersection LOS - Segment A



**Figure 4-26. Existing PM Peak Hour Arterial LOS—
City of Shoreline Arterials**

Segment B: Shoreline to Mountlake Terrace

Segment B extends north of NE 185th Street to 212th Street SW. The proposed light rail alternatives closely follow I-5, all beginning at the east side of the interstate, connecting to the Mountlake Terrace Transit Center or the Mountlake Terrace Freeway Station, then either crossing the interstate to a west side station, or continuing down the center of I-5 to a median station. One alternative includes an additional station at 220th Street SW. Table 4-20 lists the arterials or roadways potentially affected by the project.

Table 4-20. Segment B Existing Roadway Facilities

Roadway	Arterial Classification	Number of Lanes	Speed Limit (mph)	Daily Traffic Volume ^a (vehicles)
I-5	Interstate	6–8	60	163,000–190,000
SR 99	Principal Arterial	4–7	30–50	28,000–31,000
Ashworth Avenue North	Collector Arterial or Local Primary Street	2	25	1,700–1,800
Meridian Avenue North	Minor Arterial	2	35	9,000–10,800
1st Avenue NE	Collector Arterial	2	25	4,200
5th Avenue NE	Collector Arterial	2	30	2,100
10th Avenue NE	Collector Arterial	2	30	4,300
15th Avenue NE	Principal Arterial	4	35	13,500
SR 104/North 205th Street	Primary Arterial	5	40	52,300
244th Street SW	Primary Arterial/Minor Arterial	2	30	10,200–20,700
236th Street SW	Minor Arterial	2–3	30	10,400*
220th Street SW	Principal Arterial/Minor Arterial	2–5	35	31,700*
212th Street SW	Minor Arterial	2	35	11,100*
66th Avenue West	Minor Arterial/Collector Arterial	2–4	30	11,100*
58th Avenue West	Collector Arterial	2	25	2,100*
56th Avenue West	Minor Arterial	2	25	8,000*
52nd Avenue West	Minor Arterial/Collector Arterial	2	25	6,500*

^a Except where noted with an asterisk (*), year 2011 to 2012 daily traffic volumes are based on the latest available daily traffic count information available, including average annual daily traffic (AADT) volumes from the WSDOT Annual Traffic Report (2011) and average weekday daily traffic (AWDT) volumes from the Shoreline Master Plan (2011). Daily traffic volumes for locations noted with an asterisk were estimated by multiplying existing 2012 PM peak hour volumes by a factor of 10.

The PM peak-hour intersection analysis for Segment B was conducted for 19 intersections in the City of Mountlake Terrace. The AM peak-hour intersection analysis was also conducted at six of the intersections. Existing intersection analysis results, shown in Figures 4-25 and 4-26, were compared with the relevant jurisdiction's adopted LOS standard (shown in Table 4-18) to determine whether the intersection operates at an acceptable LOS. As shown in Figures 4-25 and 4-26, the 236th Street SW and 56th Avenue West intersection currently does not meet LOS standards during the AM peak hour: All Segment B intersections meet LOS standards during the PM peak hour.

Segment C: Mountlake Terrace to Lynnwood

Segment C extends along an elevated track north of 212 Street SW to a terminus near the existing Lynnwood Transit Center. Each alternative is initially aligned with I-5, then diverges to the west, either along 52nd Avenue West to 200th Street SW, west of the transit center, or close to I-5 south of the transit center. Table 4-21 lists the arterials or roadways potentially affected by the project.

Table 4-21. Segment C Existing Roadway Facilities

Roadway	Arterial Classification	Number of Lanes	Speed Limit (mph)	Daily Traffic Volume ^a (vehicles)
I-5	Interstate	6–8	60	190,000
52nd Avenue West	Minor Arterial	2–3	30	6,500*
48th Avenue West	Collector Arterial	2	25	6,500*
40th Avenue West	Collector Arterial	2	25	5,800*
36th Avenue West	Minor Arterial	2–5	35	12,700*
208th Street SW	Collector Arterial	2	30	5,100*
204th Street SW	Collector Arterial	2	15	1,900*
200th Street SW	Minor Arterial	2–4	30	16,100*
198th Street SW	Collector Arterial	2	25	700*
SR 524/196th Street SW	Principal Arterial	4–5	35	24,000–40,000

^a Except where noted with an asterisk (*), year 2011 to 2012 daily traffic volumes are based on the latest available daily traffic count information available, including average annual daily traffic (AADT) volumes from the WSDOT Annual Traffic Report (2011). Daily traffic volumes for locations noted with an asterisk were estimated by multiplying existing 2012 PM peak hour volumes by a factor of 10.

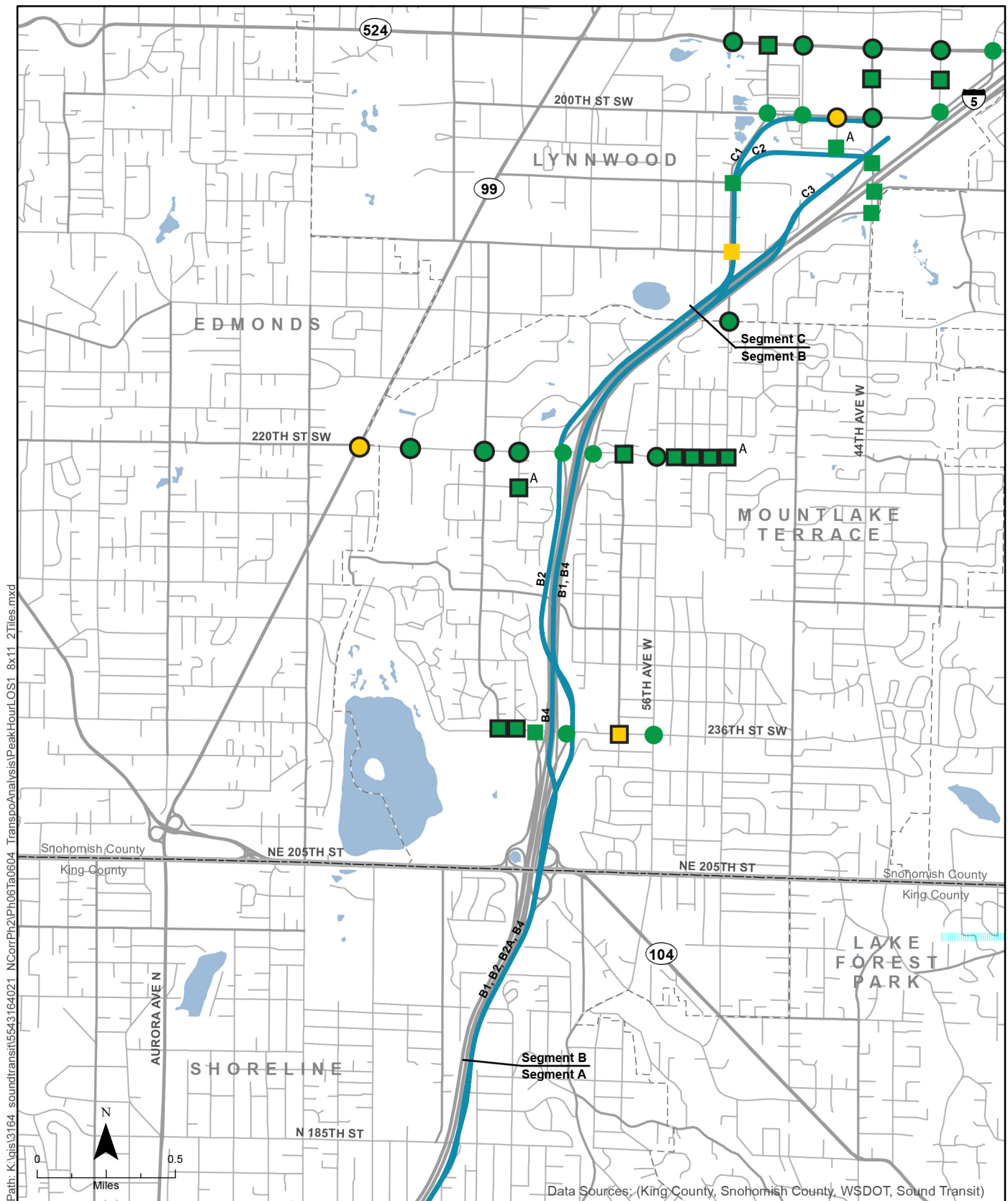
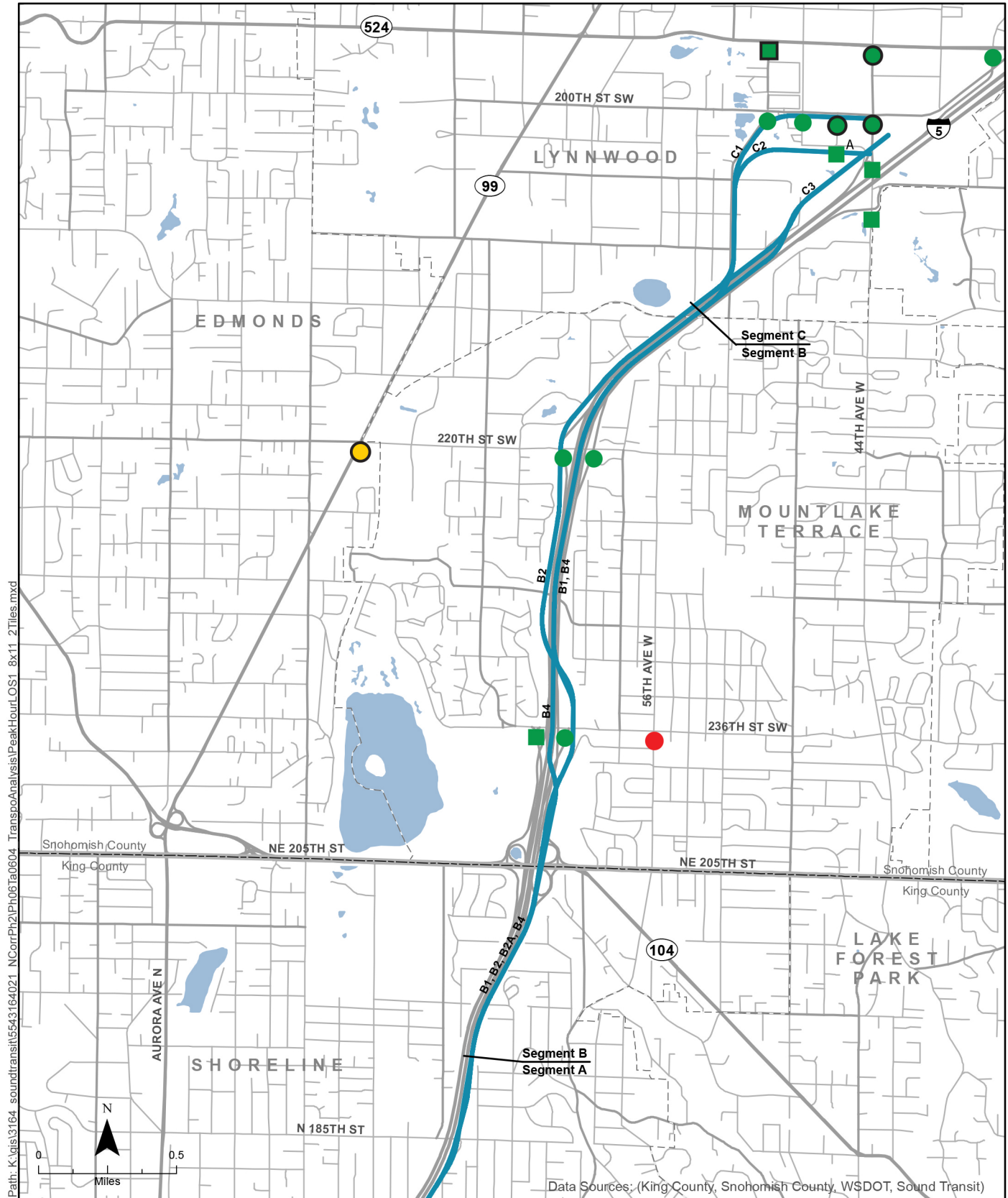


Figure 4-27
Existing PM Peak Hour
Intersection LOS - Segments B and C



Legend

Light Rail Alternatives

- A-C
- D
- E-F

Intersection Level of Service

Lynnwood non City Center arterials, WSDOT HSS¹ & Mountlake Terrace signalized intersections (see exceptions* below)

- A-C
- D
- E-F

Lynnwood City Center arterials, WSDOT non-HSS¹ & Mountlake Terrace unsignalized & signalized intersections (see exceptions* below)

- A-D
- E
- F

Intersection Control

- Signalized
- Two-Way Stop Controlled
- ^A All-Way Stop Controlled

Figure 4-28
Existing AM Peak Hour
Intersection LOS - Segments B and C

*Exceptions include intersections on 244th Street SW, 220th Street SW and 212th Street SW corridors

¹ HSS = Highways of statewide significance

The PM peak-hour traffic operations analysis for Segment C was conducted for 20 intersections in Lynnwood. The AM peak-hour intersection analysis was also conducted at 10 of the intersections. Existing intersection analysis results, shown in Figures 4-25 and 4-26, were compared with the relevant jurisdiction's adopted LOS standard (shown in Table 4-18) to determine whether the intersection operates at an acceptable LOS. As shown in Figures 4-25 and 4-26, all intersections in Segment C currently meet LOS standards during the PM and AM peak hours.

4.4.2 Property Access and Local Circulation

The property access and local circulation analysis focuses on streets, driveways, and connections most likely to be affected by the project alternatives. The evaluation of existing conditions includes a description of the physical characteristics of local street facilities near the proposed stations and along the guideway in each segment. These characteristics include the number of lanes, sidewalks, driveways, and cul-de-sacs where property access may be constrained or changed with the light rail project. The focus of the property access and local circulation analysis is on areas that would be most directly affected by the project, such as by a change in driveway operation (right turns only), street modifications, and connections.

Segment A: Seattle to Shoreline

The following is a description of the roadways most likely to be affected by the Segment A light rail alignments and stations.

1st Avenue NE, Northgate Way NE to NE 117th Street

1st Avenue NE, north of Northgate Way NE, runs along the east side of I-5 with a transition to NE 117th Street, which crosses I-5. The posted speed limit on this roadway is 30 mph. The west side of 1st Avenue NE has no development, but north of Northgate Way NE, 1st Avenue NE provides exclusive access to a set of apartment buildings (Northgate Apartments). To the east of 1st Avenue NE, NE 112th Street connects to 2nd Avenue NE and thus to Northgate Way.

North of NE 112th Street, there is one driveway with access to 1st Avenue NE. No other property access is available to 1st Avenue NE or to North 117th Street up to and across I-5 until the all-way stop-controlled intersection at 1st Avenue NE/NE 117th Street. A multi-use trail intersects 1st Avenue NE at the NE 116th Street alignment with connection to 3rd Avenue NE. Apartments east of 1st Avenue NE and north of NE 112th Street are accessed from the north via NE 115th Street.

NE 117th Street at 3rd Avenue NE

NE 117th Street is a local street connecting 3rd Avenue NE to 5th Avenue NE with residential properties and access driveway serving the Seattle Latvian Evangelical Lutheran Church.

5th Avenue NE, NE 117th Street to NE 125th Street

5th Avenue NE is a two-lane arterial roadway with on-street parking and residential development on both sides, connecting Northgate Way north to the NE 130th Street interchange area and beyond. The arterial speed limit is 30 mph on 5th Avenue NE. Single-family driveways provide access directly to and from 5th Avenue NE, with multi-family driveways on the west side of 5th Avenue NE north of NE 123rd Street extending to NE 125th Street. NE 124th Street is a local dead end street extending east from 5th Avenue NE that serves 10 homes.

NE 130th Street/I-5 Area

5th Avenue NE is on the east side of I-5 within the limited access boundaries at the NE 130th Street interchange between NE 127th Street and a church driveway, north of NE 131st Place. There is no development on the west side of 5th Avenue NE north of NE 125th Street because of its proximity to I-5. Northbound and southbound traffic on 5th Avenue NE is separated by a raised median or curb, in the limited access area, thereby limiting property access to right turns only into and out of properties between NE 127th Street and NE 131st Place along 5th Avenue NE. Four properties have limited driveway access to 5th Avenue NE between NE 127th Street and NE 130th Street. There are two little-used driveways on 5th Avenue NE between NE 130th Street and NE 131st Place.

5th Avenue NE is the connecting street for NE 131st Place access to the arterial network. Properties along 5th Avenue NE within the limited access boundaries are constrained to right turns into and out of the driveways.

NE 125th Street and NE 127th Street connect 5th Avenue NE with 8th Avenue NE and Roosevelt Way NE.

5th Avenue NE, NE 130th Street to NE 145th Street

5th Avenue NE is an arterial serving a limited number of properties and travels between NE 130th Street and NE 145th Street. Two residences have driveways to 5th Avenue NE north of NE 130th Street—both driveways appear to be little used. One side street, NE 131st Place, is a cul-de-sac serving 10 homes that intersect 5th Avenue NE, between NE 130th Street and NE 145th Street. The North Seattle Church of the Nazarene has driveways to 5th Avenue NE, serving the approximately 80-space parking lot. The NE 133rd/5th Avenue NE Park-and-Ride lot is located on the west side of 5th Avenue NE, with two driveways and a southbound bus stop. The Jackson

Park Golf Course lies on the east side of 5th Avenue NE, and there is one gated driveway for maintenance access to the park and golf course from the west.

NE 145th Street/I-5 Area

The northbound freeway off-ramp from I-5 in the NE 145th Street interchange area flows into 5th Avenue NE just south of NE 145th Street. Northbound and southbound traffic on 5th Avenue NE stops at the ramp intersection. Northbound and southbound traffic are separated on 5th Avenue NE with a raised median and curb within the limited access area of the interchange, extending just south of the northbound off-ramp to just north of the northbound on-ramp from 5th Avenue NE (approximately NE 146th Street). The North Jackson Park Park-and-Ride lot is located on the west side of 5th Avenue NE north of the northbound on-ramp to I-5. There are side-by-side left-turn pockets on 5th Avenue NE to accommodate left-turn storage for southbound left-turning traffic to NE 145th Street, and for northbound left-turning traffic to the northbound on-ramp to I-5.

5th Avenue NE is within the limited access area of the interchange, extending from approximately NE 138th Street to NE 146th Street. South of NE 145th Street, there are no driveways or access points within the limited access area. North of NE 145th Street, a few residences have driveway access within the limited access area, but with right-turn access only. NE 148th Street provides an east-west local street connection between 5th Avenue NE and 8th Avenue NE. 5th Avenue NE has bus service with a northbound bus stop just north of NE 145th Street and a southbound bus stop adjacent to the North Jackson Park Park-and-Ride lot.

3rd Avenue NE at NE 151st Street

3rd Avenue NE is a local street cul-de-sac that connects to NE 151st Street to serve the adjacent residential properties. North of NE 151st Street, 3rd Avenue NE serves five homes.

NE 155th Street/I-5 Area

NE 155th Street is a three-lane arterial with marked bicycle lanes and sidewalks on both sides in the vicinity of the NE 155th Street Station. This east-west street passes under I-5, with 1st Avenue NE located just west of I-5. On the south side of NE 155th Street, from 1st Avenue NE to 2nd Avenue NE, two driveways provide property access to the Shoreline Fire Department Station 65 and associated parking, and to one house west of 2nd Avenue NE. Between 2nd Avenue NE and 4th Avenue NE, two driveways serve residences on the south side of NE 155th Street. 2nd Avenue NE is a cul-de-sac to NE 155th Street and serves as access for 10 homes. 4th Avenue NE is a cul-de-sac to NE 155th Street and serves as access for nine homes. From 4th Avenue NE to 5th Avenue NE, there are two residential

driveways and one driveway to a church (Shoreline Full Gospel Fellowship) on the south side of NE 155th Street. The church has alternative access to 5th Avenue NE.

On the north side of NE 155th Street, from 1st Avenue NE and 3rd Avenue NE, there is one residential driveway. From 3rd Avenue NE to 5th Avenue NE, there are seven residential driveways along the north side of NE 155th Street.

Access to the Twin Ponds playground and parking lot is from 1st Avenue NE just south of NE 155th Street. A driveway on the north side of NE 155th Street serves St. Barnabas Church, just west of 1st Avenue NE.

1st Avenue NE, NE 157th Street to NE 161st Street

1st Avenue NE is a two-lane local street just east of the I-5 right-of-way that parallels 3rd Avenue NE with local street connections along NE 157th Street, NE 158th Street, NE 159th Street, and NE 161st Street. 1st Avenue NE provides driveway access to adjacent residential properties.

1st Avenue NE, NE 170th Street to NE 174th Street

1st Avenue NE is a two-lane local street just east of the I-5 right-of-way that parallels 2nd Avenue NE with local street connections on NE 170th Street and NE 174th Street, providing driveway access for the adjacent residential properties.

NE 178th Street at 2nd Place NE and 3rd Avenue NE Cul-de-Sacs

NE 178th Street is a two-lane local street that provides driveway access to the adjacent residential properties, with connection to the 2nd Place NE cul-de-sac serving 10 homes and connection to the 3rd Avenue NE cul-de-sac serving nine homes.

NE 185th Street/I-5 Area

NE 185th Street is a two-lane street with sidewalks on both sides. NE 185th Street crosses over I-5. East of I-5, there is one driveway access from NE 185th Street on the south side between 7th Avenue NE and 8th Avenue NE. 7th Avenue NE is a cul-de-sac north of NE 185th Street that serves nine homes. NE 189th Street is a local street extending west from 8th Avenue NE to serve five homes, located just east of the I-5 right-of-way.

South of NE 185th Street, 5th Avenue NE extends to connect to NE 180th Street, with two cul-de-sacs to the east (NE 182nd Court with seven homes and NE 183rd Court with five homes) and 12 homes with driveways to 5th Avenue NE.

West of I-5 along NE 185th Street, 5th Avenue NE connects to the north, serving the Shoreline School District properties. On the north side of NE 185th Street, from 3rd Avenue NE to 5th Avenue NE, there are six residential driveways and one

driveway to the parking lot adjacent to the school sports field. On the south side of NE 185th Street from 3rd Avenue NE to the bridge over I-5, there are eight residential driveways.

NE 195th Street at I-5 Pedestrian Bridge

NE 195th Street is a two-lane local street serving adjacent residential properties. The pedestrian bridge over I-5 connects to street ends on both sides.

Segment B: Shoreline to Mountlake Terrace

The following is a description of the roadways most likely to be affected by the Segment B light rail alignments and stations.

Mountlake Terrace Transit Center Area

236th Street SW is the arterial adjacent to the Mountlake Terrace Transit Center, with a sidewalk on the north side of the street through the study area (west of I-5 extending east of 58th Avenue West). A south sidewalk extends east from the I-5 northbound off-ramp to beyond 58th Avenue West. The transit center and park-and-ride lot access to 236th Street SW is at the signalized intersection with the I-5 northbound off-ramp. This is the sole vehicle access to the transit center and park-and-ride facility. Eight homes have driveway access to the south side of 236th Street SW, between the Mountlake Terrace Transit Center and 58th Avenue West. On the north side of 236th Street SW, between the Mountlake Terrace Transit Center and 58th Avenue West, there is a cul-de-sac (59th Place West serving nine homes) and three residential driveways.

West of I-5 along 236th Street SW, there is no driveway access until the intersection at 68th Avenue West.

Access to I-5 at 236th Street SW is provided via a half-diamond interchange with a northbound off-ramp and southbound on-ramp.

220th Street SW/I-5 Area

220th Street SW is a major east-west arterial with an interchange connection to I-5, sidewalks along both sides, but no driveway access on the south side between the I-5 interchange and 64th Avenue West. A channelized access driveway to the north provides right-in and right-out access for businesses on the north side of 220th Street SW. Residential development on the south side of 220th Street SW has property access via 220th Place SW and 64th Avenue West. The intersection of 220th Street SW at 64th Avenue West is signalized with full access to all quadrants.

222nd Street SW is a local street that serves residential and school properties. This street connects to the arterial network at 64th Avenue West where the intersection has all-way stop control.

Ten homes access 222nd Street SW directly with driveways between 62nd Avenue West and 64th Avenue West. A secondary local street access to the arterial network is south via 62nd Avenue West and west along 224th Street SW to 64th Avenue SW.

North of the 220th Street SW interchange area, 64th Avenue West is a two-lane roadway collector that becomes 219th Street SW with commercial property access on both sides. 219th Street SW becomes 60th Avenue West that serves commercial properties on the west side. 60th Avenue West is the arterial west of I-5. North of St. Albion Way, 60th Avenue West serves residential land uses at 214th Street SW and beyond. 214th Street SW at 58th Avenue W is a local street intersection serving residential properties with a street end abutting the I-5 right-of-way.

Segment C: Mountlake Terrace to Lynnwood

The following is a description of the roadways most likely to be affected by the Segment C light rail alignments and stations.

52nd Avenue West/Cedar Valley Road

52nd Avenue West is a three- to five-lane arterial with sidewalks on both sides from its route under I-5 (four lanes) to 208th Street SW (five lanes) and continuing as Cedar Valley Road (three-lane roadway) to 200th Street SW. Property access along 52nd Avenue West, from I-5 to 208th Street SW, includes five residential driveways and two driveways at a church on the west side and one residential driveway plus two commercial/industrial driveways on the east side. From 208th Street SW to the Interurban Trail crossing, there is only one driveway on the east side of the street. From the Interurban Trail to 206th Street SW, there are six residential driveways on the west side and one commercial/industrial driveway on the east side. This property only has access to 52nd Avenue West.

Between 206th Street SW and 204th Street SW, driveways on 52nd Avenue West serve the Grange Hall and two residences on the west side of the street; no access points are provided along the east side. From 204th Street SW to where 52nd Avenue West transitions to Cedar Valley Road, there are three residential driveways and one cul-de-sac with five homes on the west side of the street. One driveway on the east side of 52nd Avenue West serves WorkSource Lynnwood with an auxiliary access to 204th Street SW.

Cedar Valley Road south of 200th Street SW has four driveways serving professional office buildings on the west side. On the east side, there are two driveways serving business park developments as well as a driveway and parking lot at Scriber Creek

Park (with trail). These driveways are not interconnected; each driveway on the east side is a sole access point for the property.

East of 52nd Avenue West, 208th Street SW is a two-lane roadway serving industrial and commercial properties. 208th Street SW intersects with 50th Avenue West, a local street cul-de-sac, crosses the Interurban Trail, and ends just north of the trail crossing. Multiple commercial driveways connect to 208th Street SW. 208th Street SW is the sole access to 52nd Avenue West and the street network for these properties.

Lynnwood Transit Center Area

200th Street SW is a three-lane street west of 46th Avenue West with sidewalks on both sides of the street. Driveways provide access to apartment complex developments on the north side of the street (two driveways between 46th Avenue West and 48th Avenue West, three driveways between 48th Avenue West and 50th Avenue West). On the south side of 200th Street SW, two driveways serve apartments between 50th Avenue West and 48th Avenue West, and one driveway serves a business park between 48th Avenue West and 46th Avenue West.

Commercial properties have access to 200th Street SW between 46th Avenue West and 44th Avenue West via four commercial driveways on the north side and two commercial driveways on the south side. Additional property access to these commercial properties is provided via 48th Avenue West, 46th Avenue West, and 44th Avenue West. Additional property access to the apartment complexes is provided via 50th Avenue West and 48th Avenue West.

Alderwood Mall Boulevard is a five-lane arterial extending east of 200th Street SW from the 44th Avenue West intersection. There are commercial property driveways on the north and south sides of the roadway.

48th Avenue West serves multifamily residential developments north and south of 200th Street SW. This roadway also provides access on the east side to commercial buildings, the Lynnwood Park-and-Ride, and the Lynnwood Transit Center.

South of 200th Street SW, 46th Avenue West provides access to business and commercial properties with driveways on the west and east sides of the street. It also provides access to the Lynnwood Park-and-Ride and Lynnwood Transit Center.

The Lynnwood direct access interchange with I-5 provides access to and from the HOV lanes in both directions along I-5, with a connection into the Lynnwood Park-and-Ride.

4.5 Nonmotorized Facilities

This section describes the existing and no build conditions for pedestrian and bicycle travel facilities within the study area. Key observations and findings related to existing nonmotorized travel in the project area include the following:

- Streets in Seattle surrounding proposed station areas are generally old and lacking ADA-accessible walkways at intersections. Sidewalks are typically 5 feet wide.
- Streets in Shoreline are generally without sidewalks.
- Pedestrian volumes are low throughout the corridor except in Lynnwood, where there are a moderate number of pedestrians.
- Bicycle lanes are sporadic and bicycles generally share a lane with traffic.
- The multi-use Interurban Trail is approximately 1 mile west of the NE 145th Street, NE 155th Street, NE 185th Street, and Mountlake Terrace Station areas. It then reaches within 0.50 mile of the 220th Street SW Station area and is between the existing Lynnwood Transit Center/Park-and-Ride and I-5.

4.5.1 Pedestrian Facilities

Existing pedestrian facilities were inventoried on all arterials within 0.50 mile of each station for all light rail alternatives. Arterials were identified based on each jurisdiction's transportation plans. The inventory includes streets classified as arterials, collector arterials, and collectors, so that all streets connecting the station to activity centers are those included in the existing conditions inventory. Typical pedestrian facilities are sidewalks, pedestrian walkways and paths, and multi-use trails.

A pedestrian LOS was evaluated for intersections within 300 feet of proposed stations where intersection data were collected for the traffic analysis. Existing pedestrian volumes were gathered from PM peak hour intersection data, collected primarily in May 2012. The LOS analysis was based on a pedestrian flow rate in pedestrians per minute and the sidewalk width. The resulting LOS is based on the *Highway Capacity Manual* methodology. Pedestrian LOS for sidewalks was analyzed using the methodology from the *Highway Capacity Manual* (Transportation Research Board 2000) and the TCQSM. Pedestrian LOS is a measure of walking conditions on a sidewalk.

Segment A: Seattle to Shoreline

Streets that would be affected by one or more project alternatives along Segment A include 1st Avenue NE, NE 117th Street, and 5th Avenue NE. There are sidewalks on the east side of 1st Avenue NE and the north side of NE 117th Street. There are sidewalks on the east side of 5th Avenue NE south of NE 130th Street, but no sidewalks between NE 130th Street and NE 145th Street.

The pedestrian facilities within 0.50 mile of NE 130th Street, NE 145th Street, NE 155th Street, and NE 185th Street Station areas are presented in Figures 4-27, 4-28, 4-29, and 4-30, respectively. The pedestrian environment at each station is described below for each station area.

NE 130th Street/I-5 Area

The NE 130th Street Station would be located in the northeast quadrant of the I-5 interchange in Seattle. The streets in this area of Seattle are generally old and lacking ADA-accessible walkways at intersections. Sidewalks are typically 5 feet wide without planting strips. There are pedestrian paths adjacent to arterials that consist of an at-grade asphalt path separated from the edge of the street by a gravel and grass strip.

Figure 4-27 shows these types of paths along NE 130th Street, the west side of 1st Avenue NE, and the collector arterials around Haller Lake. The bus stop at Meridian Avenue North, south of NE 130th Street, has no sidewalk or curb.

Pedestrian activity is generated at the bus stops located on each leg of the NE 130th Street/5th Avenue NE intersection. Pedestrian volumes were one to two pedestrians per hour at the intersection of NE 130th Street and 5th Avenue NW, resulting in an LOS A rating for the existing sidewalks.

NE 145th Street/I-5 Area

The NE 145th Street Station would be located in the northeast quadrant of the I-5 interchange. The city of Seattle is south of NE 145th Street, and the city of Shoreline is north of NE 145th Street. The streets in the vicinity are generally old and lacking ADA-accessible sidewalks at intersections. Some intersection locations have been upgraded to current ADA standards, but most have not yet been upgraded. Sidewalks are typically 5 feet wide without planting strips. This condition occurs all along NE 145th Street.

There are pedestrian paths adjacent to arterials that consist of an at-grade asphalt path separated from the edge of the street by a gravel and grass strip. These are located along the west side of Meridian Avenue North, south of NE 145th Street, on the east side of 1st Avenue NE. There are asphalt pedestrian paths at the interchange to provide pedestrian access to the existing bus-transit freeway flyer stops. These are shown on Figure 4-28.

Pedestrian activity is generated at the bus stops located on each leg of the NE 145th Street/5th Avenue NE intersection, the freeway flyer stops, and other periodic pedestrian movements. Pedestrian volumes were six to eight pedestrians per hour in the east-west direction at NE 145th Street and 5th Avenue NW, resulting in LOS A conditions on existing sidewalks.

NE 155th Street/I-5 Area

The NE 155th Street Station would be located in the northeast quadrant of NE 155th Street and I-5. As shown on Figure 4-29, there are sidewalks on all of the arterials within 0.50 mile of the station. The sidewalks are in variable conditions.

Pedestrian activity is generated at the bus stops located on NE 155th Street near 5th Avenue NE and 6th Avenue NE, as well as other periodic pedestrian movements. Pedestrian volumes were two to eight pedestrians per hour along NE 155th Street from 1st Avenue NE to 3rd Avenue NE, resulting in an LOS A rating for the existing sidewalks.

NE 185th Street/I-5 Area

The NE 185th Street Station would be located in the northeast quadrant of I-5 and NE 185th Street in Shoreline. The sidewalks are in variable conditions. Some intersection locations have been upgraded to current ADA standards.

The sidewalks on 9th Avenue, a local street, were included in the inventory because it is one of the few local streets with sidewalks. In addition, 9th Avenue may provide a pedestrian route from the potential light rail station to the North City commercial and multifamily housing area at 15th Avenue NE and NE 180th Street.

10th Avenue NE, north of NE 185th Street, is an arterial street with no sidewalks. Sidewalks are on the parallel street of 8th Avenue NE and along NE 180th Street, and therefore these streets were included in the inventory. NE Perkins Way has a striped paved shoulder/walkway on the north side. The roadway is steep and winding with concrete barriers along curves to protect pedestrians.

A paved multi-use trail exists along NE 195th Street between 1st Avenue NE and Meridian Avenue North. There is no vehicle access along this segment of street right-of-way. Figure 4-30 provides the inventory of the NE 185th Street Station area pedestrian facilities.

Pedestrian activity is generated at the bus stops located on each leg of NE 185th Street between the bridge and 7th Avenue NE, as well as other neighborhood pedestrian activity. Pedestrian volumes were one to six pedestrians per hour along NE 185th Street from 5th Avenue NE to 8th Avenue NE, resulting in an LOS A rating for the existing sidewalks.

Segment B: Shoreline to Mountlake Terrace

There is a pedestrian and bicycle overcrossing of I-5 at NE 195th Street, located north of the proposed NE 185th Street Station and south of the Mountlake Terrace Transit Center. The pedestrian facilities within 0.50 mile of the proposed Mountlake Terrace Transit Center Station and 220th Street SW Station are presented in Figures 4-31 and 4-32. The pedestrian environment at these station areas is described below.

Mountlake Terrace Transit Center Area

The Mountlake Terrace Transit Center Station would be located at the existing Mountlake Terrace Park-and-Ride, while the Mountlake Terrace Freeway Station is located in the I-5 median adjacent to the park-and-ride. A pedestrian trail through Veteran's Memorial Park connects the existing Mountlake Terrace Park-and-Ride to the Mountlake Terrace Town Center. This trail is a soft-surface wooded trail.

Pedestrian activity is generated at the bus stops located on each leg of 236th Street SW between the I-5 bridge and the transit center entrance, including other periodic pedestrian movements. Pedestrian volume counts indicated about six pedestrians per hour in the east and west directions on 236th Street SW at the transit center entrance, resulting in an LOS A rating for the existing sidewalks.

220th Street SW/I-5 Area

The 220th Street SW Station would be located in the southwest quadrant of the I-5 interchange. Local streets within 0.5 mile of this proposed station generally have sidewalks on only one side. The Interurban Trail is within 1 mile of the station site to the west and northwest.

Pedestrian volume counts show one to three pedestrians per hour at 220th Street SW and the I-5 off-ramps. Pedestrian volumes were counted at one to six pedestrians per hour in the vicinity of 220th Street SW and 64th Avenue West. The pedestrian LOS rating is A for the existing sidewalks at these locations.

Segment C: Mountlake Terrace to Lynnwood

No pedestrian facilities would be affected by the light rail alignment along Segment C. The pedestrian facilities within 0.50 mile of the Lynnwood Transit Center and future station areas are presented in Figure 4-33. The pedestrian environment is described below.

There are sidewalks on all of the streets in downtown Lynnwood and in the vicinity of the station alternatives. The Interurban Trail extends through the station areas. This trail is an on-street facility adjacent to 52nd Avenue West between 208th Street SW and the power line segments. To the north, the trail follows the Snohomish County Public Utility District (PUD) power line right-of-way, crosses over 44th Avenue West on a pedestrian/bicycle bridge, and then continues adjacent to the west side of I-5.

Pedestrian volumes are generated by the downtown activity, transit center, and park-and-ride lots. Pedestrian volumes at 200th Street SW and 46th Avenue West ranged from 32 to 48 pedestrians per hour, resulting in an LOS A rating for pedestrians. At 46th Avenue West and 48th Avenue West/Interurban Trail, there were 154 pedestrians per hour crossing the north leg of this intersection. During the PM peak

hour, pedestrians are leaving the transit center via a plaza and entering the park-and-ride lot to the southeast. Pedestrians either traverse directly into the park-and-ride lot or use 48th Avenue West/Interurban Trail, which has 10-foot-wide sidewalks on the south side at this location. A 10-foot-wide sidewalk with 154 pedestrians per hour results in an LOS B rating.

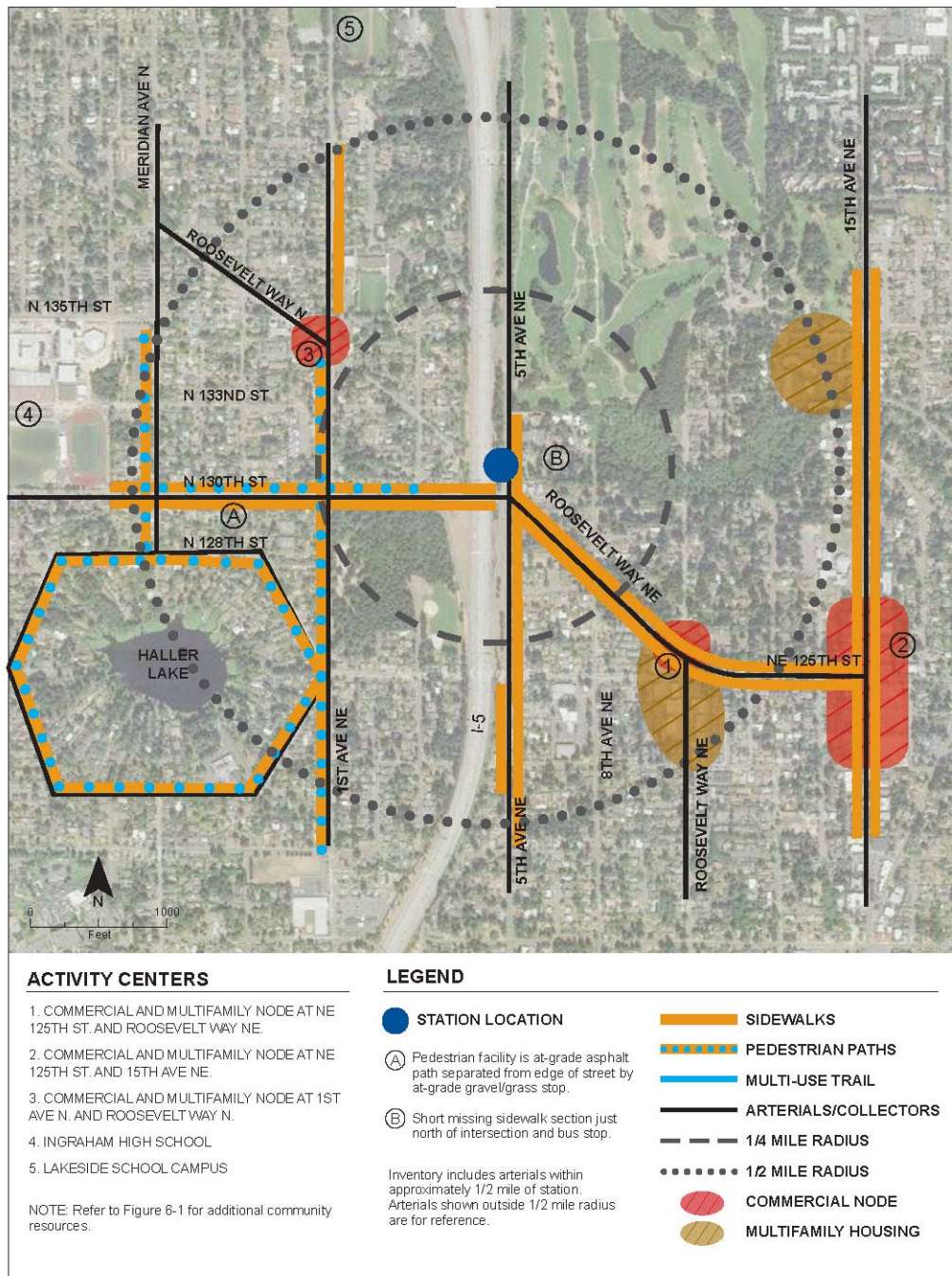


Figure 4-29. NE 130th Street Station Pedestrian Facility Inventory

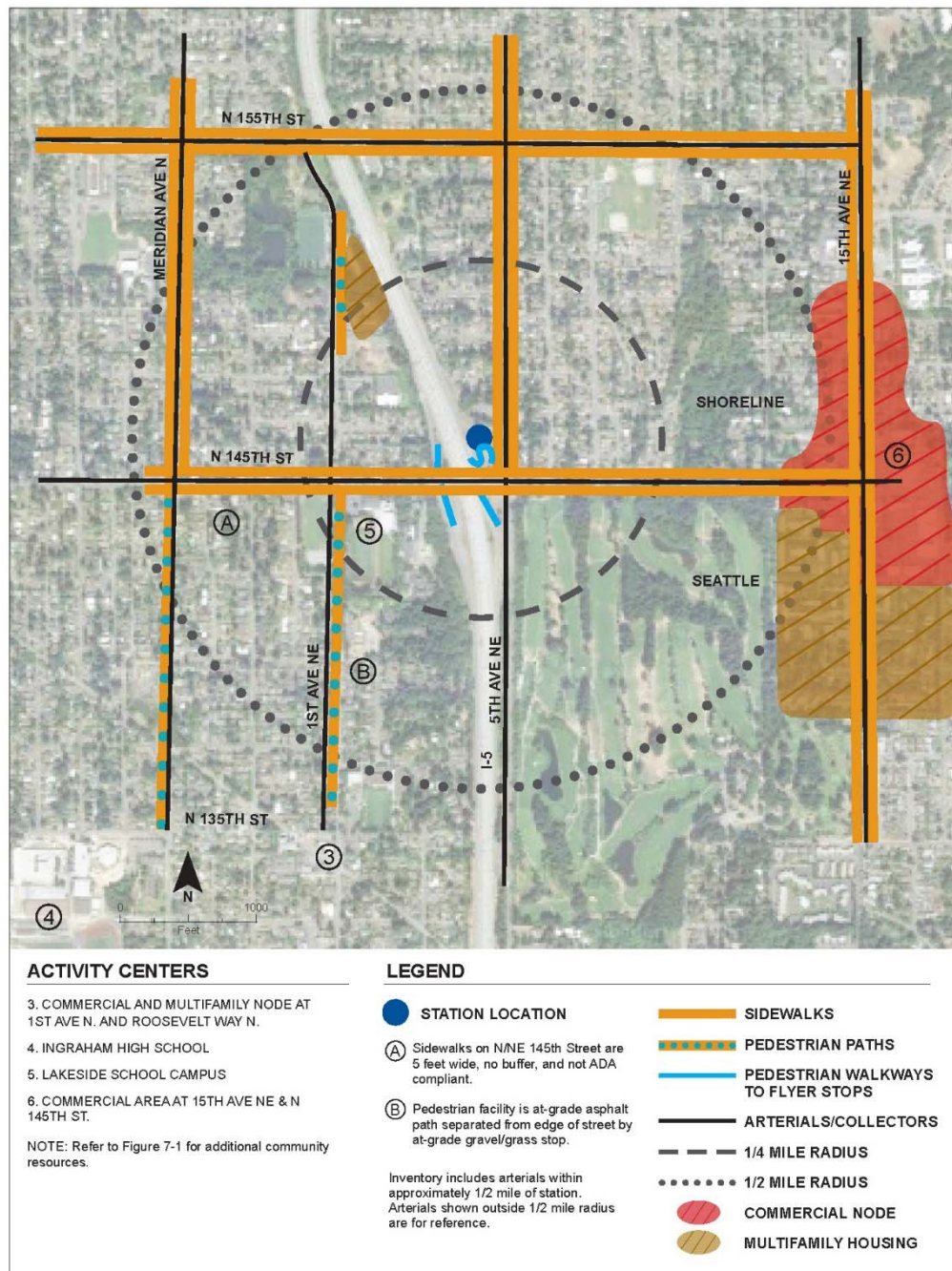


Figure 4-30. NE 145th Street Station Pedestrian Facility Inventory

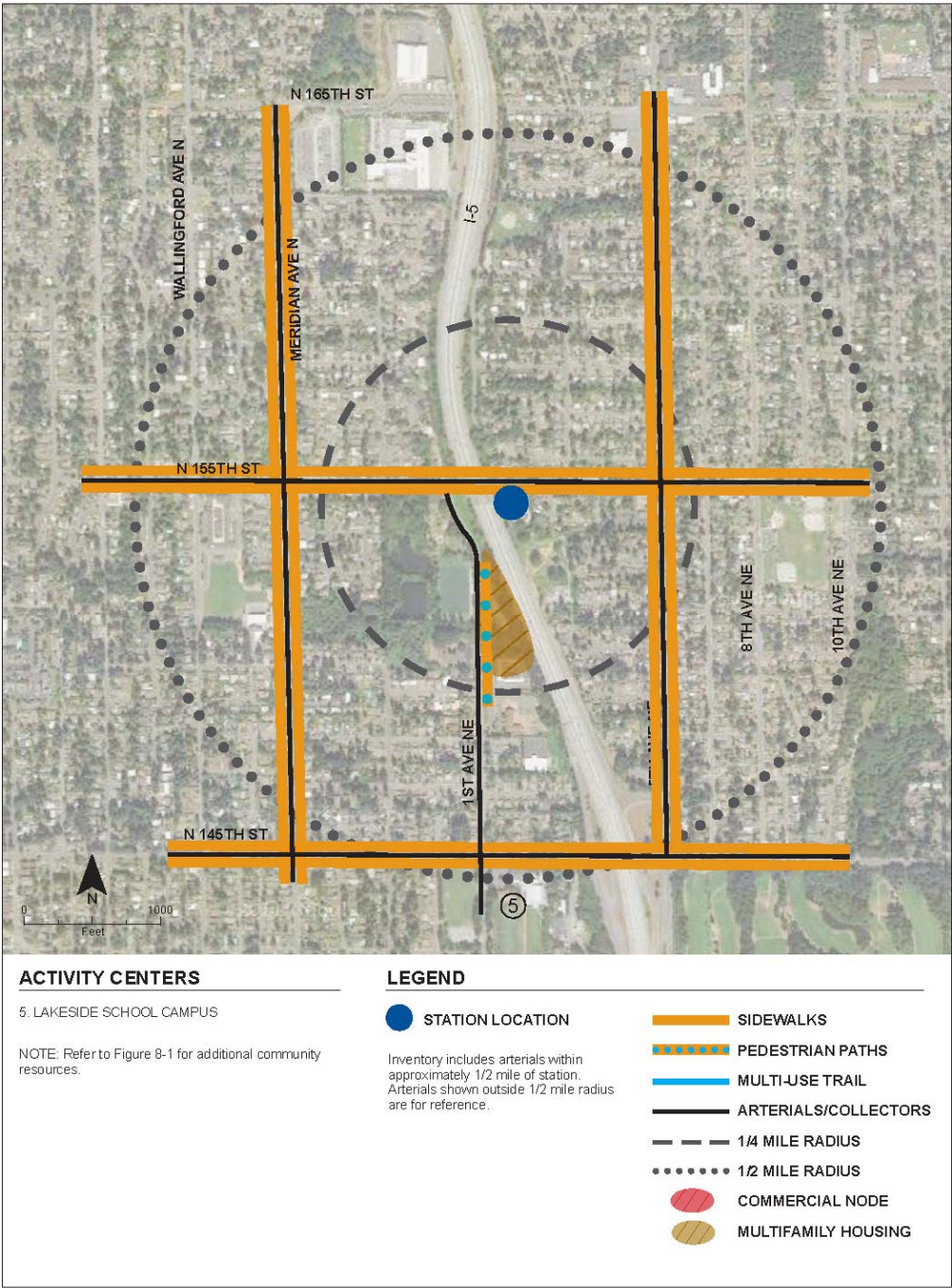


Figure 4-31. NE 155th Street Station Pedestrian Facility Inventory

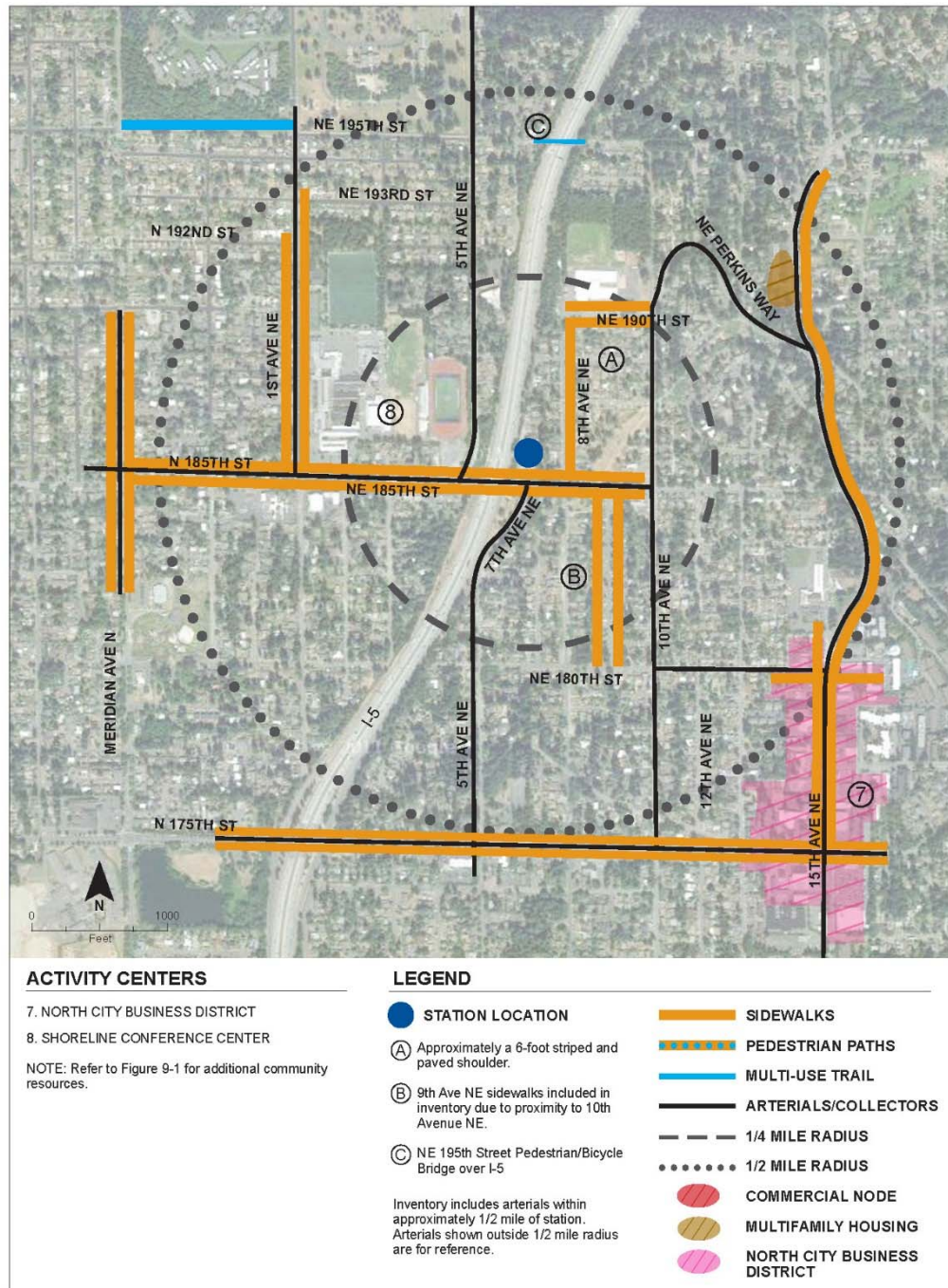


Figure 4-32. NE 185th Street Station Pedestrian Facility Inventory

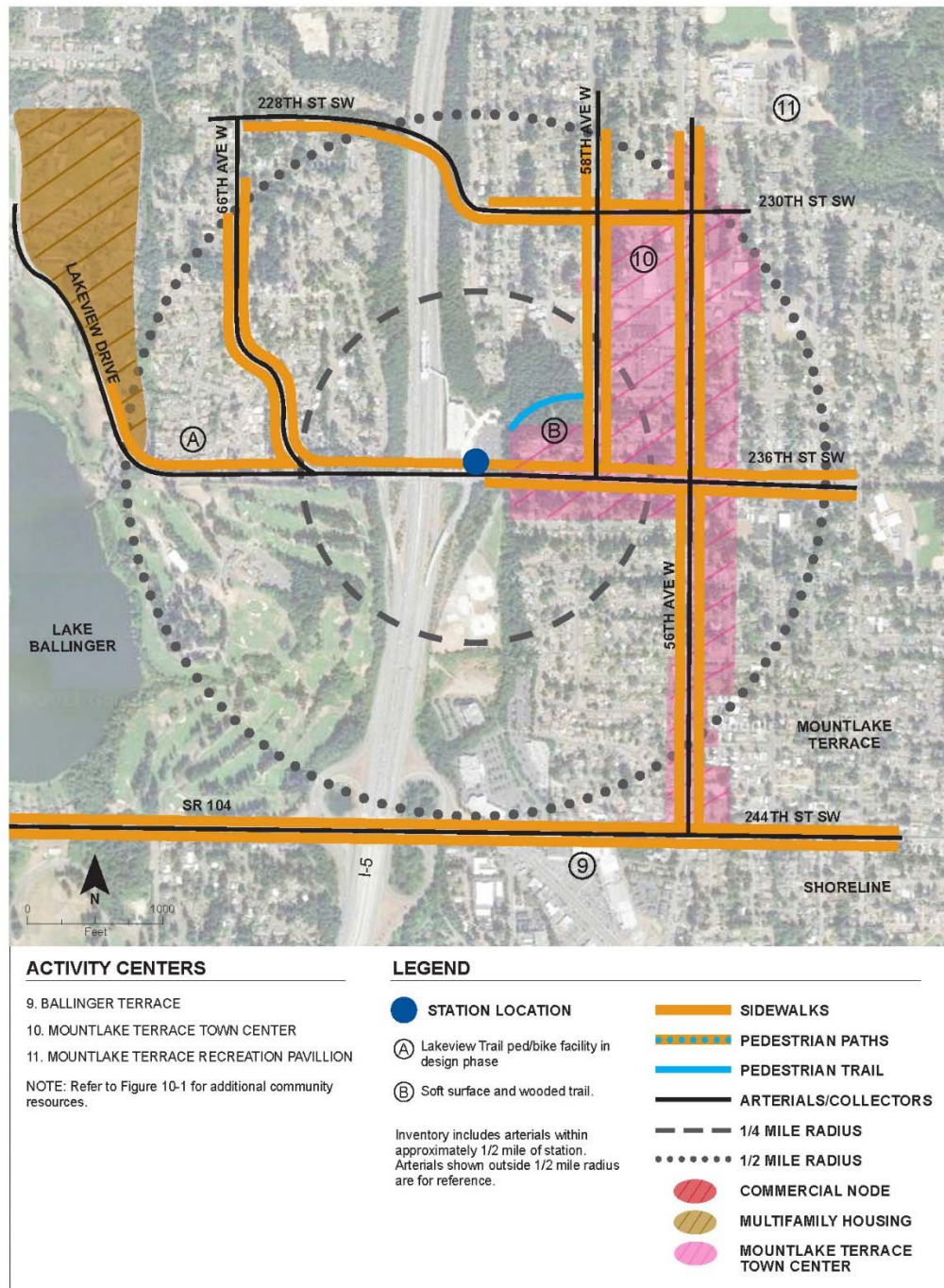


Figure 4-33. Mountlake Terrace Transit Center Station Pedestrian Facility Inventory

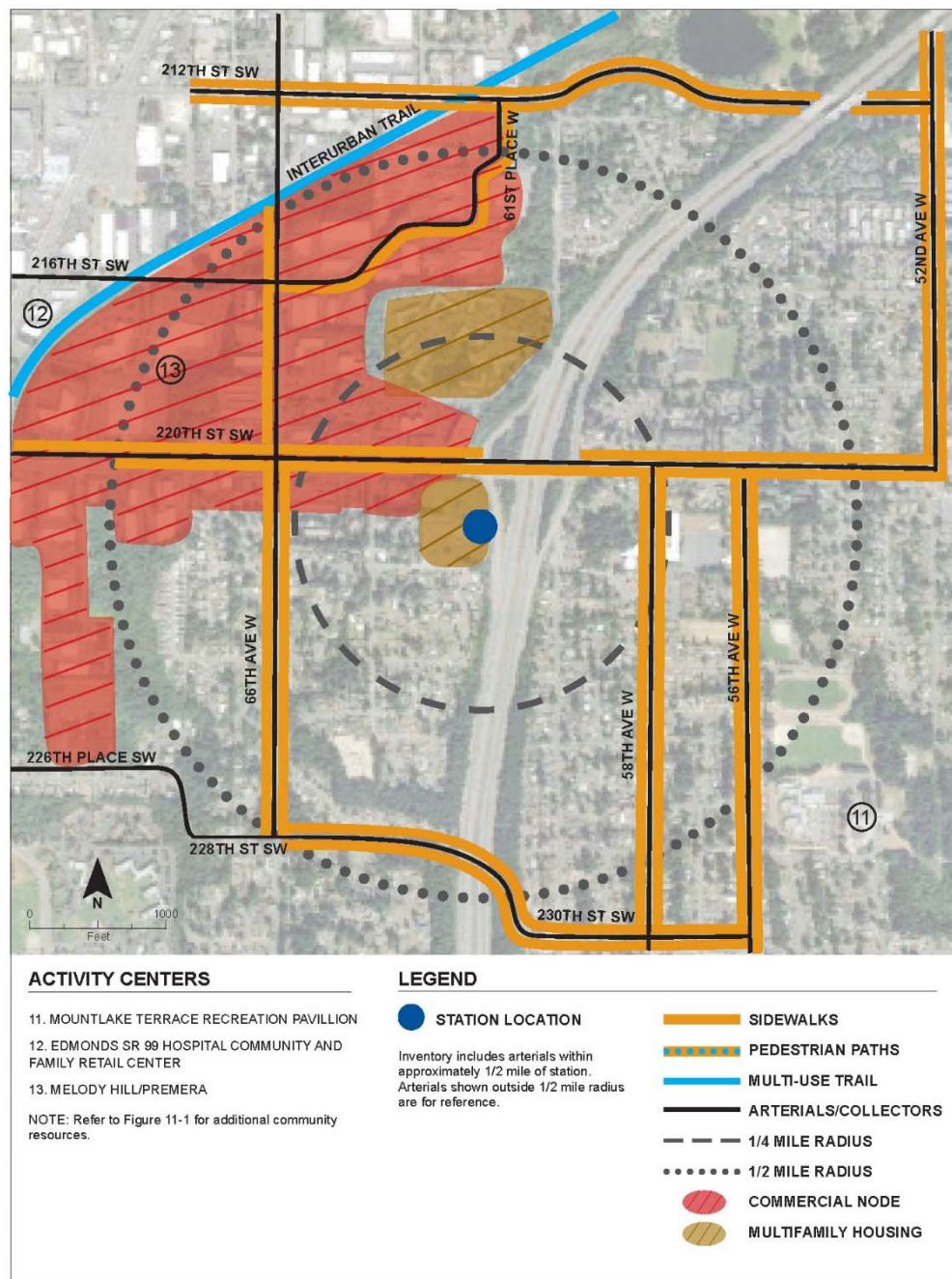


Figure 4-34. 220th Street SW Station Pedestrian Facility Inventory

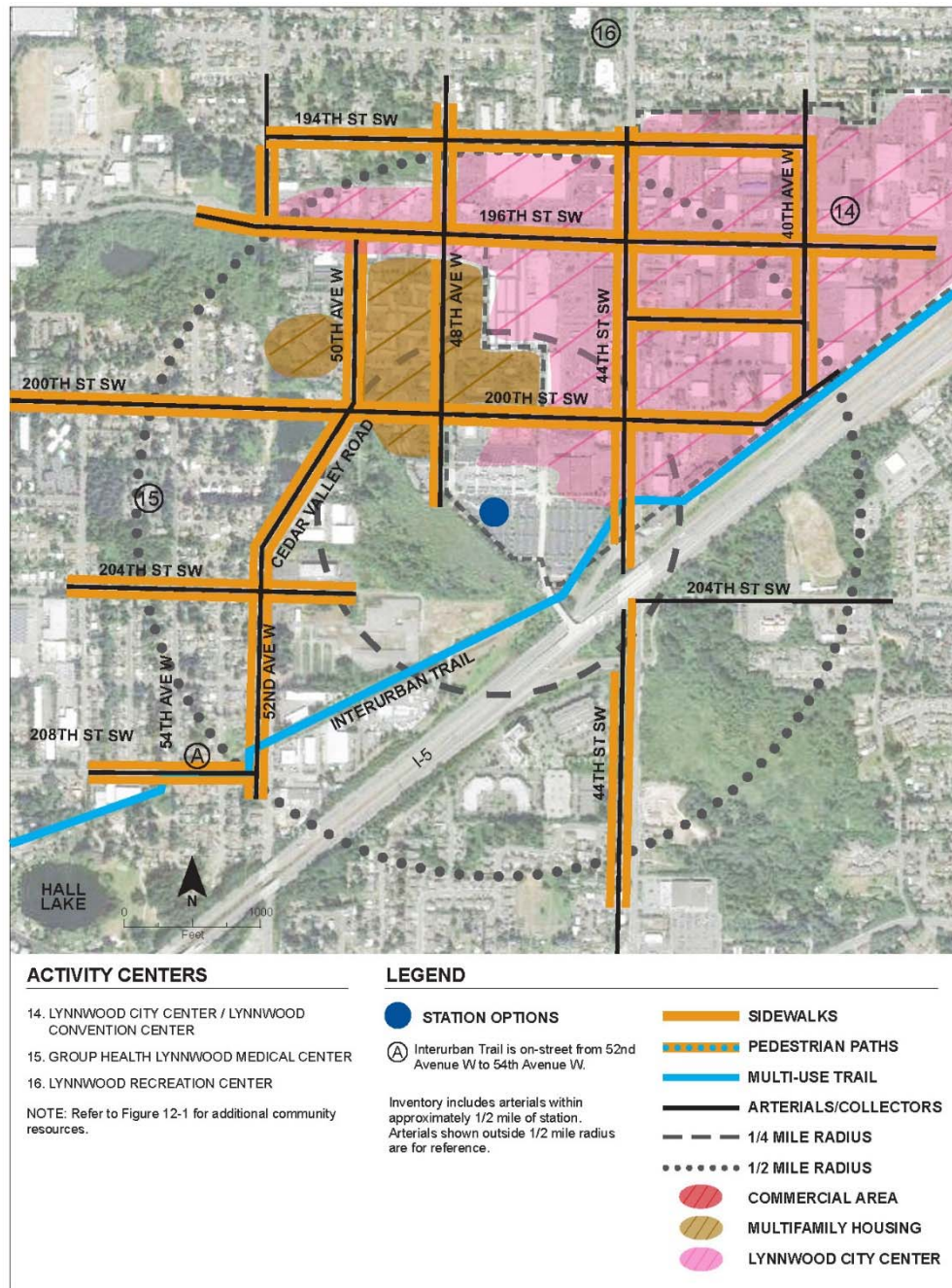


Figure 4-35. Lynnwood Transit Center Station Pedestrian Facility Inventory

4.5.2 Bicycle Facilities

Existing bicycle facilities were inventoried on all arterials within 1 mile of each proposed station for all light rail alternatives. Arterials were identified based on each jurisdiction's transportation plans. Arterials include streets classified as arterials, collector arterials, and collectors. Typical bicycle facilities are bicycle lanes, multi-use trails, and streets with wide lanes or wide paved shoulders that are identified as shared-use facilities.

Segment A: Seattle to Shoreline

Streets that would be affected by one or more project alternatives along Segment A include 1st Avenue NE, NE 117th Street, and 5th Avenue NE. There are wide curb lanes adjacent to sidewalks or paved shoulders on these streets.

The bicycle facilities within 1 mile of the NE 130th Street, NE 145th Street, NE 155th Street, and NE 185th Street Stations are presented in Figures 4-34, 4-35, 4-36, and 4-37, respectively.

The bicycle environment at each station is described below.

NE 130th Street/I-5 Area

The NE 130th Street Station would be located in the northeast quadrant of the I-5 interchange in Seattle. The streets in this area of Seattle are generally old and lacking in constructed bicycle facilities. The City of Seattle uses a pavement marking called a sharrow to define streets that should be shared by vehicles and bicycles. The existing bicycle facility inventory is shown in Figure 4-34. There are sharrows along 1st Avenue NE from 0.50 mile south of NE 130th Street, north to Roosevelt Way NE, and for a short segment on Roosevelt Way NE through a small commercial area. Sharrows also occur on the collector streets that surround Haller Lake and to the west on NE 125th Street. East of I-5 there is a bicycle lane on NE 125th Street, from Roosevelt Way NE going east beyond the 1-mile radius from the station location.

NE 145th Street/I-5 Area

The NE 145th Street Station would be located in the northeast quadrant of the I-5 interchange. The city limits of Seattle and Shoreline are along the center line of NE 145th Street. The existing bicycle facility inventory is shown in Figure 4-35.

Bicycle lanes are provided on NE 155th Street from 5th Avenue NE going west beyond the 1-mile radius from the station location. There is also a segment of bicycle lane on 15th Avenue NE from approximately NE 150th Street going north beyond the 1-mile radius.

NE 155th Street/I-5 Area

The NE 155th Street Station would be located over NE 155th Street along the east side of I-5. The existing bicycle facility inventory is shown in Figure 4-36. There are bicycle lanes on NE 155th Street from 5th Avenue NE to the west beyond the 1-mile radius from the station. There are also bicycle lanes on 15th Avenue NE, which is a north-south arterial approximately 1 mile from the station. These bicycle lanes begin at approximately NE 150th Street and extend northward.

NE 185th Street/I-5 Area

The NE 185th Street Station would be located in the northeast quadrant of the I-5 interchange in Shoreline. The existing bicycle facility inventory is shown in Figure 4-37. Bicycle lanes are provided on NE 185th Street from 1st Avenue NE to the west. There are sharrows on 10th Avenue NE from NE 175th Street to NE 190th Street. North of NE 190th Street, 10th Avenue NE becomes NE Perkins Way, which has a striped paved shoulder/walkway on the north side. The roadway is steep and winding, with concrete barriers along the curves to protect pedestrians.

At NE 195th Street, there is a bridge over I-5 for pedestrians and bicycles. Farther to the west, a paved multi-use trail exists along NE 195th Street between 1st Avenue NE and Meridian Avenue North. No vehicle access is available along this segment of street right-of-way.

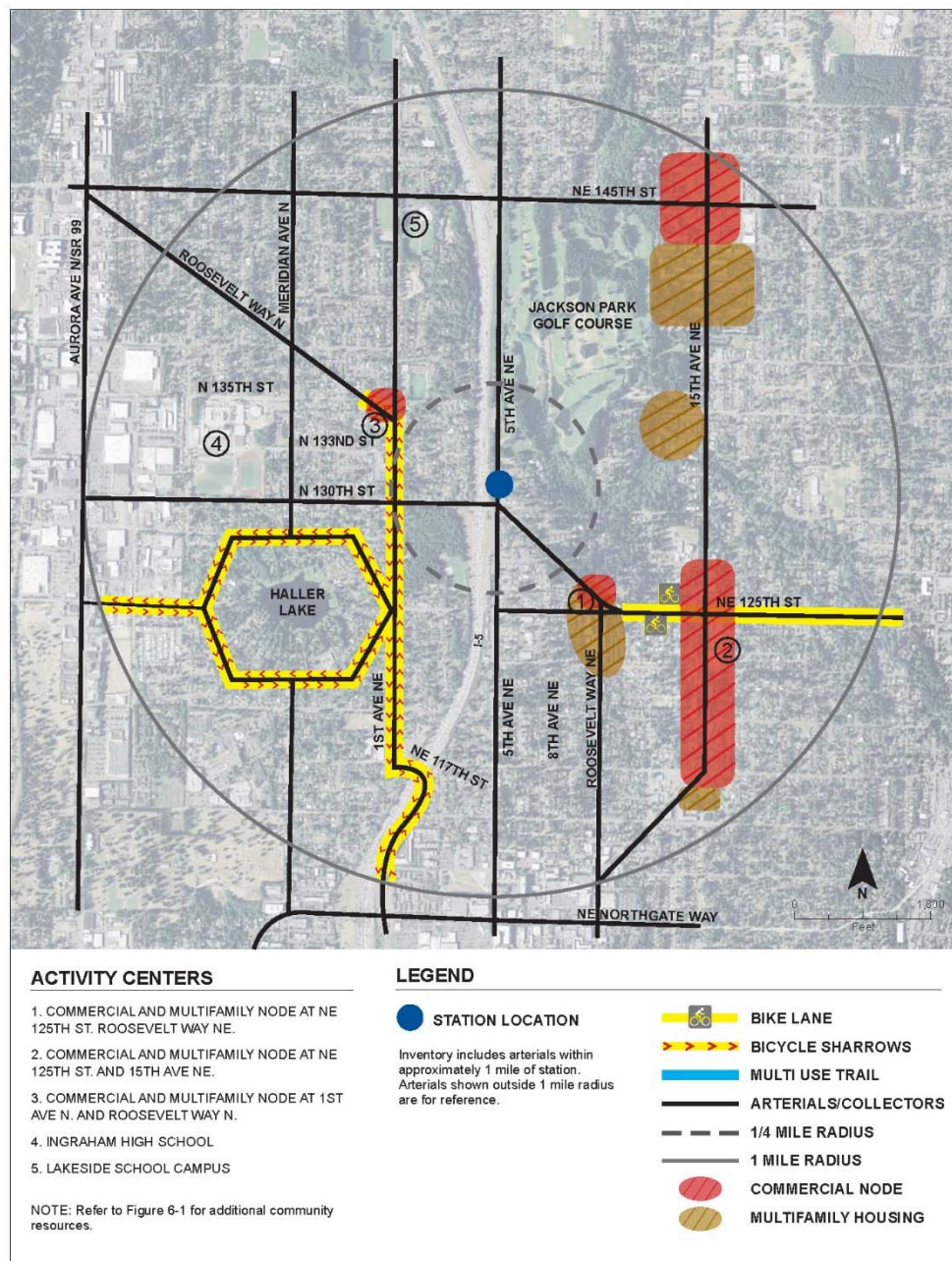


Figure 4-36. NE 130th Street Station Bicycle Facility Inventory

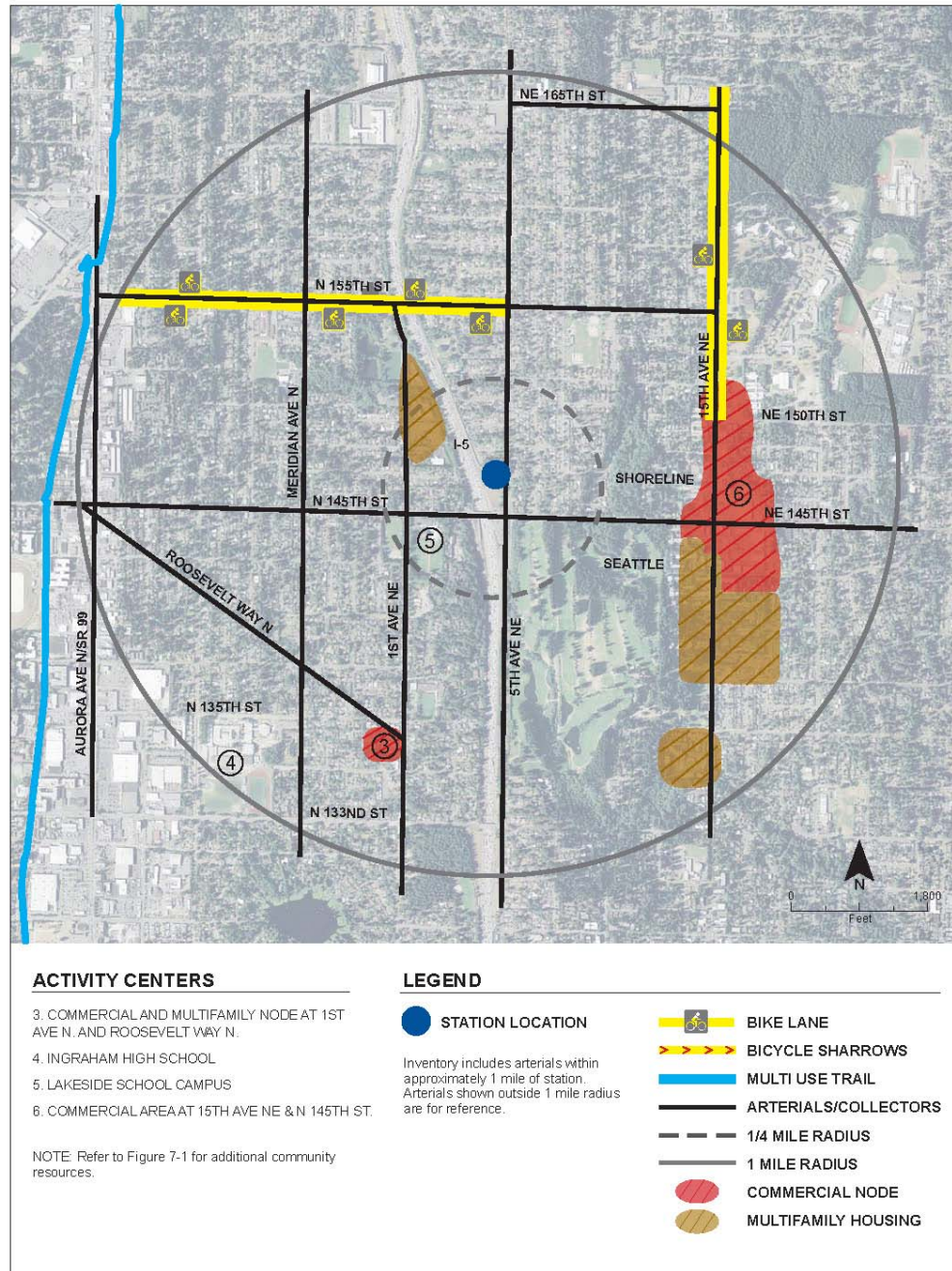


Figure 4-37. NE 145th Street Station Bicycle Facility Inventory

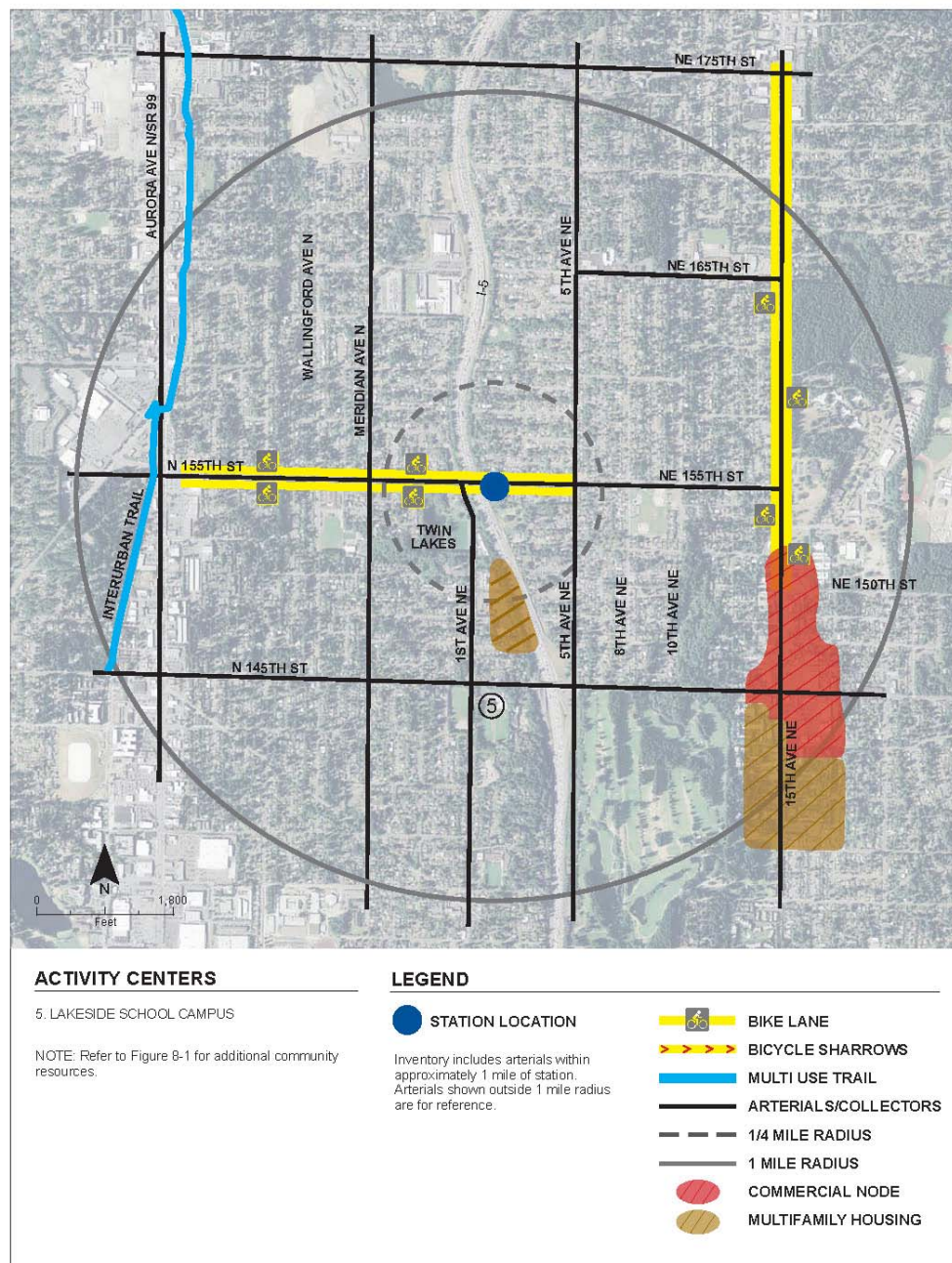


Figure 4-38. NE 155th Street Station Bicycle Facility Inventory

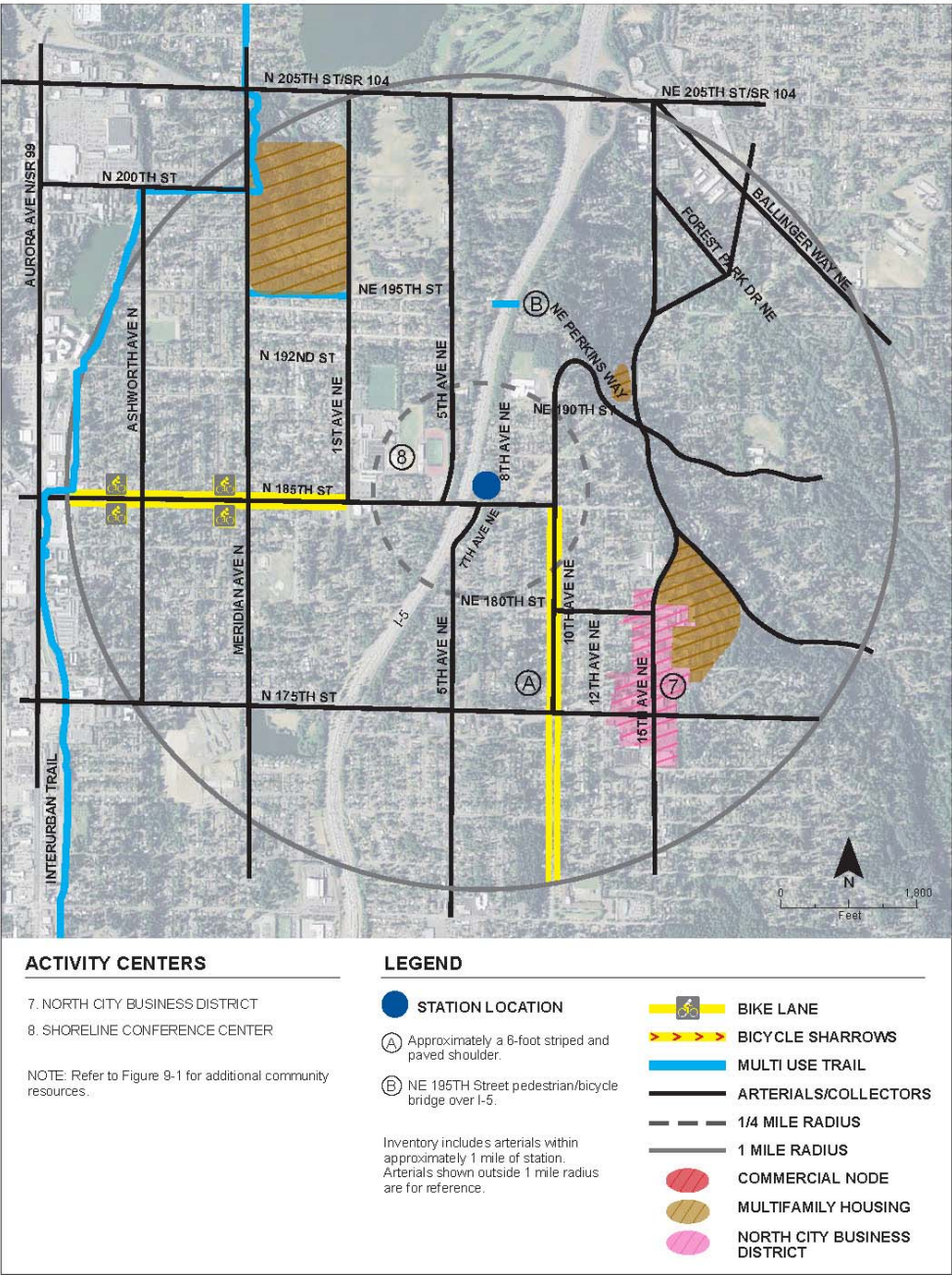


Figure 4-39. NE 185th Street Station Bicycle Facility Inventory

Segment B: Shoreline to Mountlake Terrace

A pedestrian and bicycle overcrossing of I-5 is located at NE 195th Street, north of the NE 185th Street Station and south of the Mountlake Terrace Transit Center.

The Interurban Trail is approximately 1 mile west of the Mountlake Terrace Transit Center. The Interurban Trail is a regional facility and connects Lynnwood with Mountlake Terrace within the proposed light rail corridor.

The bicycle facilities within 1 mile of the Mountlake Terrace Transit Center Station are presented in Figure 4-38. The bicycle environment at this station is summarized below.

Mountlake Terrace Transit Center Area

A bicycle lane is available on both sides of 230th Street SW north of the Mountlake Terrace Transit Center. The lane extends from 56th Avenue West to I-5. The arterial extends across I-5 but without the bicycle lanes. On the south side, the eastbound bicycle lane begins immediately after the arterial overcrossing and provides space for bicycles to climb the eastbound uphill grade.

The Interurban Trail crosses 228th Street SW, at a little more than 1 mile from the Mountlake Terrace Transit Center. Bicycle volumes on the trail at this location during one PM peak hour were approximately nine northbound and four southbound cyclists. During the AM peak hour there were four northbound and two southbound cyclists (PSRC 2010).

A multi-use pedestrian/bicycle facility is under design for the north side of 236th Street and Lakeview Drive, from the west side of the freeway interchange to the Interurban Trail.

220th Street SW/I-5 Area

Bicycle facilities are not available on arterials in the 220th Street SW area (Figure 4-39). The Interurban Trail is near the 220th Street SW Station (0.50 mile) and connects to the Lynnwood Transit Center to the north.

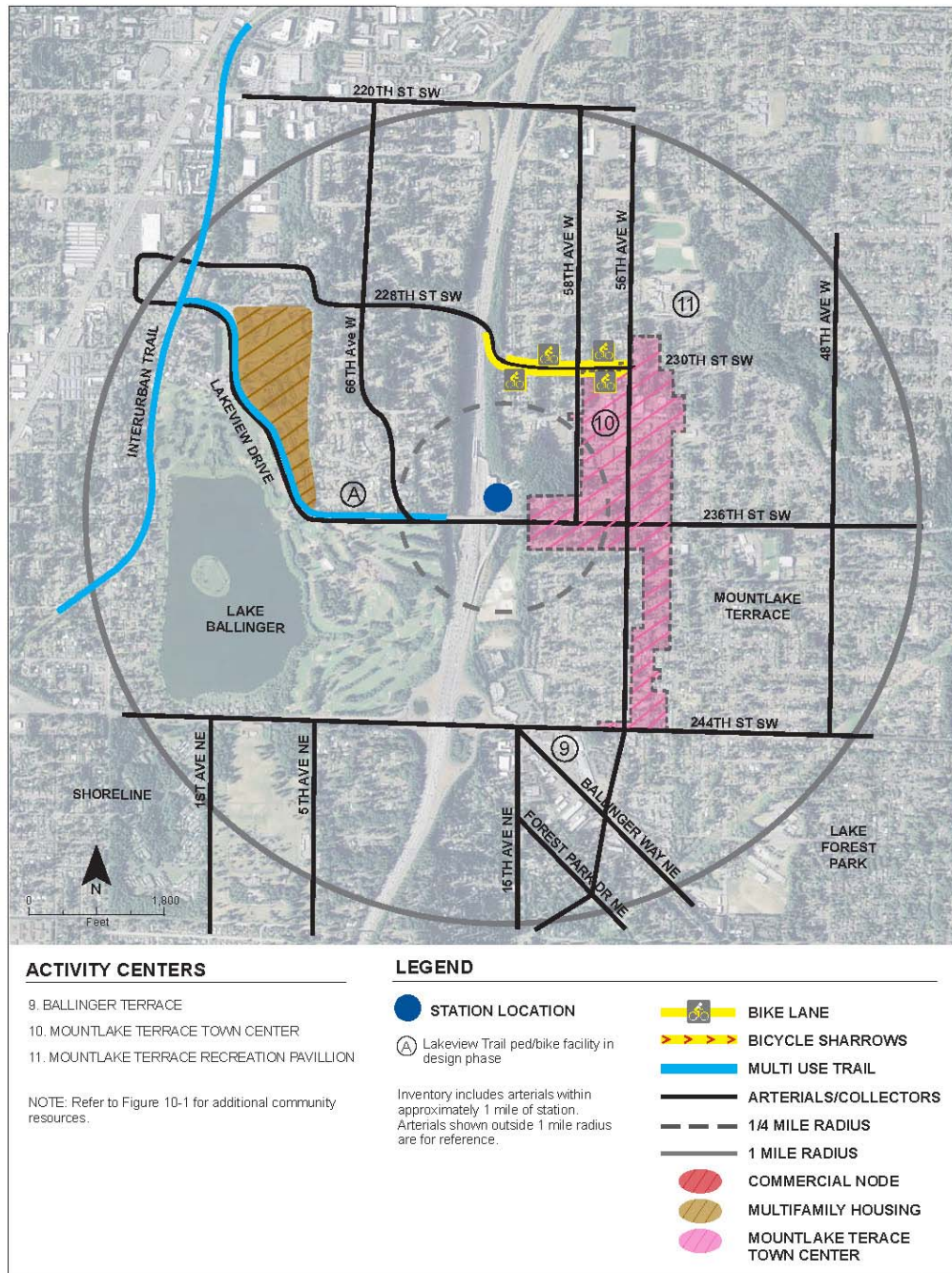


Figure 4-40. Mountlake Terrace Transit Center Station Bicycle Facility Inventory

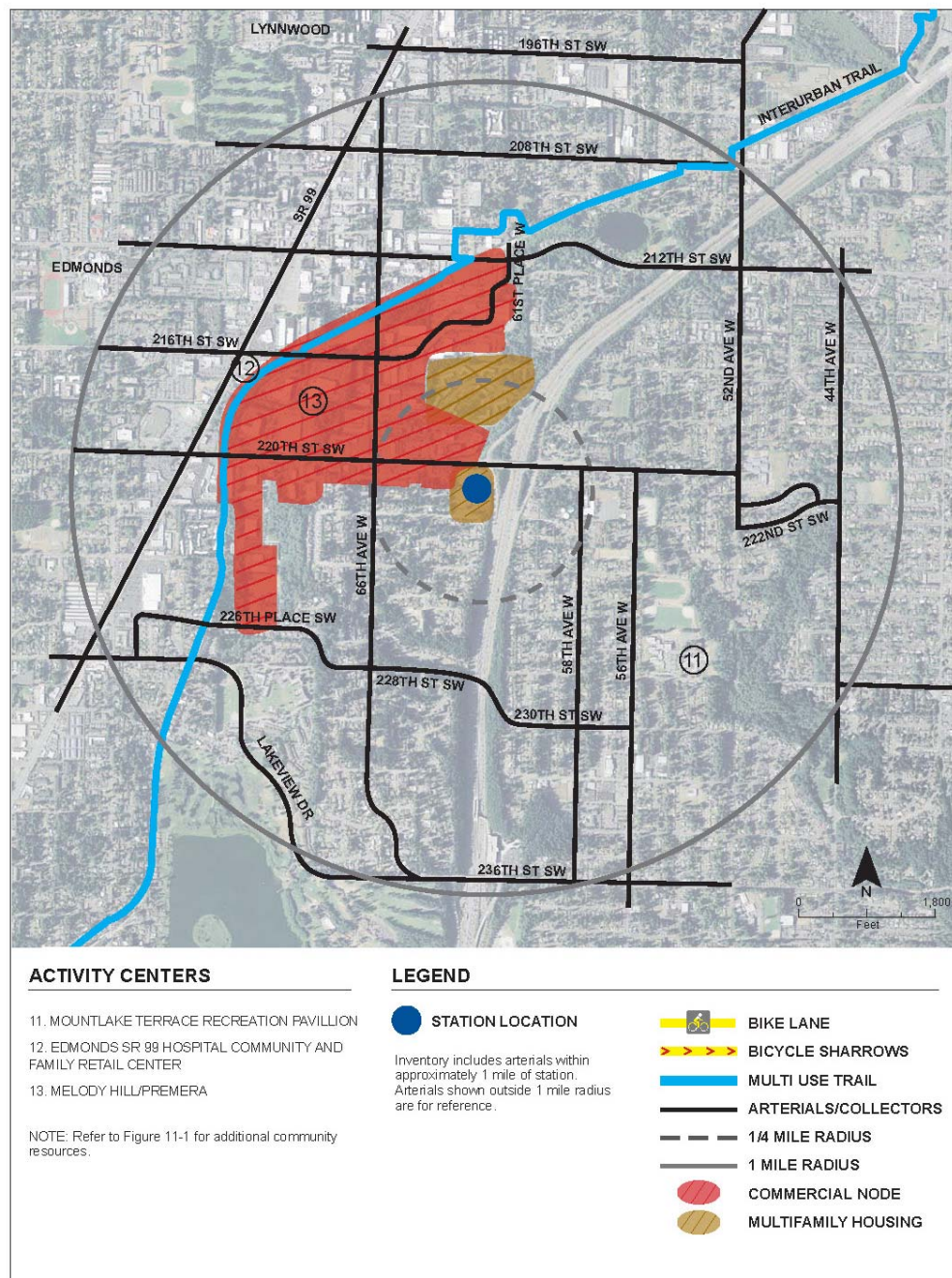


Figure 4-41. 220th Street SW Station Bicycle Facility Inventory

Segment C: Mountlake Terrace to Lynnwood

Bicycle lanes are on 52nd Avenue West and Cedar Valley Road from 208th Street SW, in the vicinity of the Interurban Trail, north to 200th Street SW (Figure 4-40). A shared lane for bicycles also is available on 200th Street SW from 50th Avenue West through the 1-mile inventory area.

The Interurban Trail passes through the station areas. It is an on-street facility adjacent to 52nd Avenue West between 208th Street SW and the power line segments. To the north, the trail follows the Snohomish County PUD power line right-of-way, then crosses over 44th Avenue West on a pedestrian/bicycle bridge, and continues on the west side of I-5.

Bicycle volumes on the Interurban Trail were available north and south of the Lynnwood Transit Center. During one hour of the PM peak period, there were 18 bicycles on the trail at 37th Avenue West and Alderwood Mall Boulevard. On 208th Street SW, east of 52nd Avenue West where the Interurban Trail is on-street for a short segment, there were five bicycles on the trail during one PM peak hour (PSRC 2010).

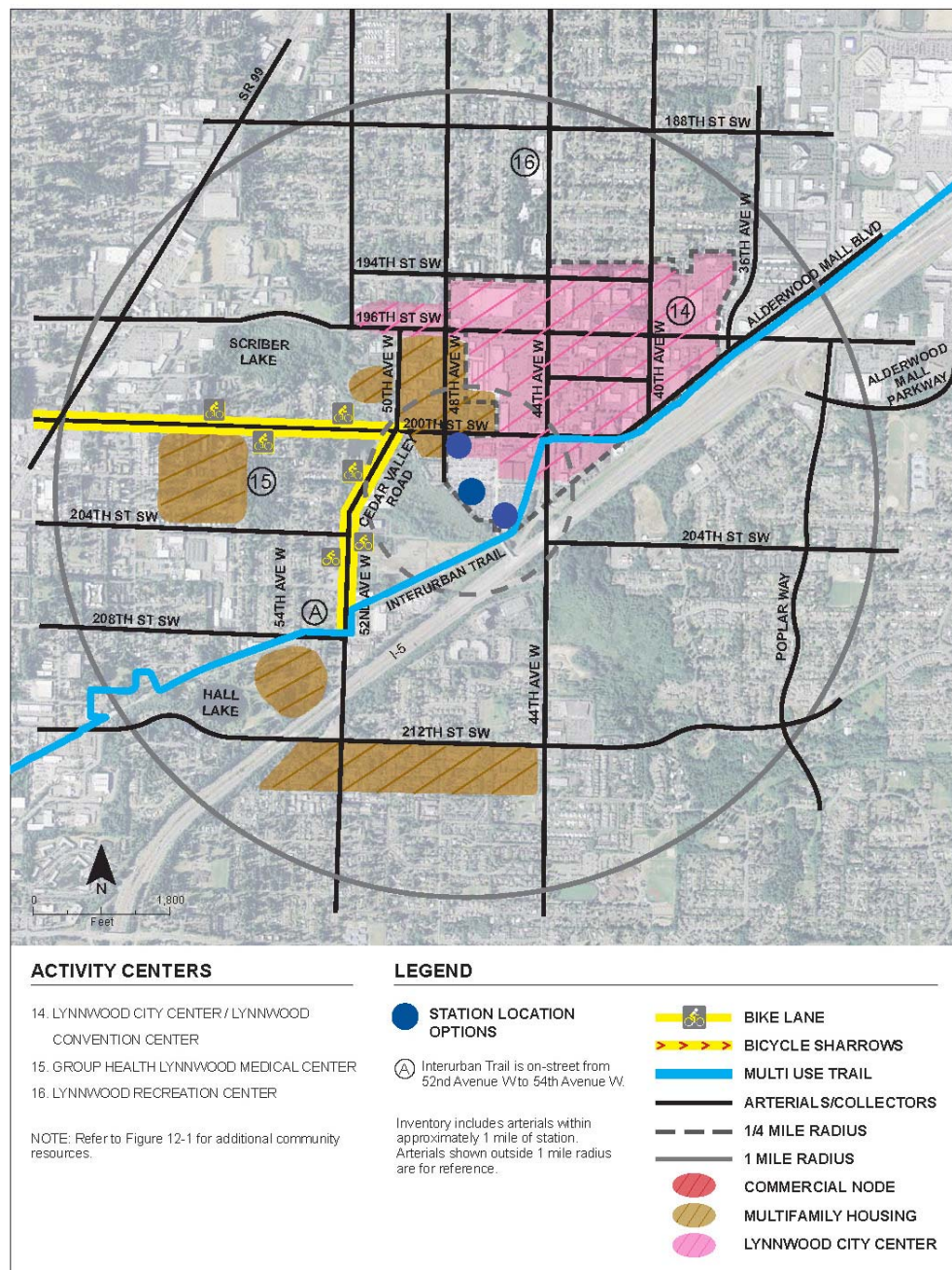


Figure 4-42. Lynnwood Transit Center Station Bicycle Facility Inventory

4.6 Freight Mobility and Access

Freeways, arterials, and local roadways throughout the project vicinity are vital to the movement of freight and goods between major transportation hubs, such as the Port of Seattle and Sea-Tac Airport, including other business and customer destinations. Within the Lynnwood Link Extension study area, only roadways are used for freight transportation. West of the study area, the Burlington Northern Santa Fe (BNSF) Railway owns and operates a dual-track mainline, which connects Portland, Oregon, to Everett, Washington, and carries more than 5 million tons of goods per year. Also located west of the Lynnwood Link Extension study area, Puget Sound is classified as a freight waterway, carrying more than 25 million tons of goods a year.

I-5 is the principal freight route through the Puget Sound region and is located within the Lynnwood Link Extension study area. In addition, many arterial streets throughout the corridor are also identified as truck routes.

4.6.1 Key Freight Roadways

The Washington State Freight and Goods Transportation System (FGTS) is used to classify highways, county roads, and city streets according to the average annual gross truck tonnage they carry. Truck tonnage values are derived from actual or estimated truck traffic count data that are converted into average weights by truck type. Classifications range from T-1, which includes roadways that carry over 10 million tons per year, to T-5, which includes roadways that carry over 20,000 tons in 60 days. Table 4-22 summarizes the classifications and the corresponding tonnage.

Table 4-22. Freight and Goods Transportation System Classifications

FGTS Classification	Annual Gross Tonnage
T-1	More than 10 million tons
T-2	4 to 10 million tons
T-3	300,000 to 4 million tons
T-4	100,000 to 300,000 tons
T-5	At least 20,000 tons in 60 days and less than 100,000 tons per year

Source: Washington State Freight and Goods Transportation System 2011 Update, March 2012.

The principal freight route (classified as T-1) through the Puget Sound region is I-5, which is located within the study area. About 186,000 vehicles travel on the I-5 mainline every day. Of this number, about 11,000 are trucks, or 6 percent of the total vehicles.

The following sections describe the specific freight roadways and corresponding classifications for each segment of the project corridor.

Segment A: Seattle to Shoreline

In addition to routes identified by WSDOT as part of the FGTS, truck routes in Segment A include arterial streets identified as major truck streets within Seattle and truck routes in Shoreline.

Figure 4-41 shows the location of existing FGTS-classified freight routes in Segment A, in addition to truck routes identified by the Cities of Seattle and Shoreline.

Key roadways classified as T-1 in Segment A are:

- I-5
- NE Northgate Way from I-5 to Lake City Way NE (SR 522)

Key roadways classified as T-2 are:

- North Northgate Way west of I-5
- NE 175th Street
- NE 185th Street
- Greenwood Avenue North
- Lake City Way NE (SR 522)

Key roadways classified as T-3 are:

- NE 125th Street
- North 130th Street
- North 145th Street
- North 155th Street
- NE 175th Street/5th Avenue NE
- Lake City Way NE/SR 522
- Aurora Avenue North (SR 99)
- Meridian Avenue North
- 15th Avenue NE
- 25th Avenue NE

Key study area roadways classified as T-4 are:

- 5th Avenue North
- NE 175th Street
- Roosevelt Way NE

Segment B: Shoreline to Mountlake Terrace

In addition to routes identified by the FGTS, truck routes in Segment B include arterial streets identified as truck routes in Shoreline and truck routes in Mountlake Terrace. Existing freight routes in Segment B, identified by the FGTS and the Cities of Shoreline and Mountlake Terrace, are shown in Figure 4-42.

As shown in Figure 4-42, I-5 is the only roadway classified as T-1 in Segment B.

Key roadways classified as T-2 are:

- 220th Street SW
- 66th Avenue West

Key roadways classified as T-3 are:

- Ballinger Way NE (SR 104)
- NE 205th Street
- 244th Street SW
- 236th Street SW
- 212th Street SW
- Aurora Avenue North/Pacific Highway (SR 99)
- Meridian Avenue North
- 15th Avenue NE
- 19th Avenue North/56th Avenue West
- 52nd Avenue West

No additional roadways are designated as freight or truck routes by the City of Shoreline or the City of Mountlake Terrace in addition to those identified by the FGTS.

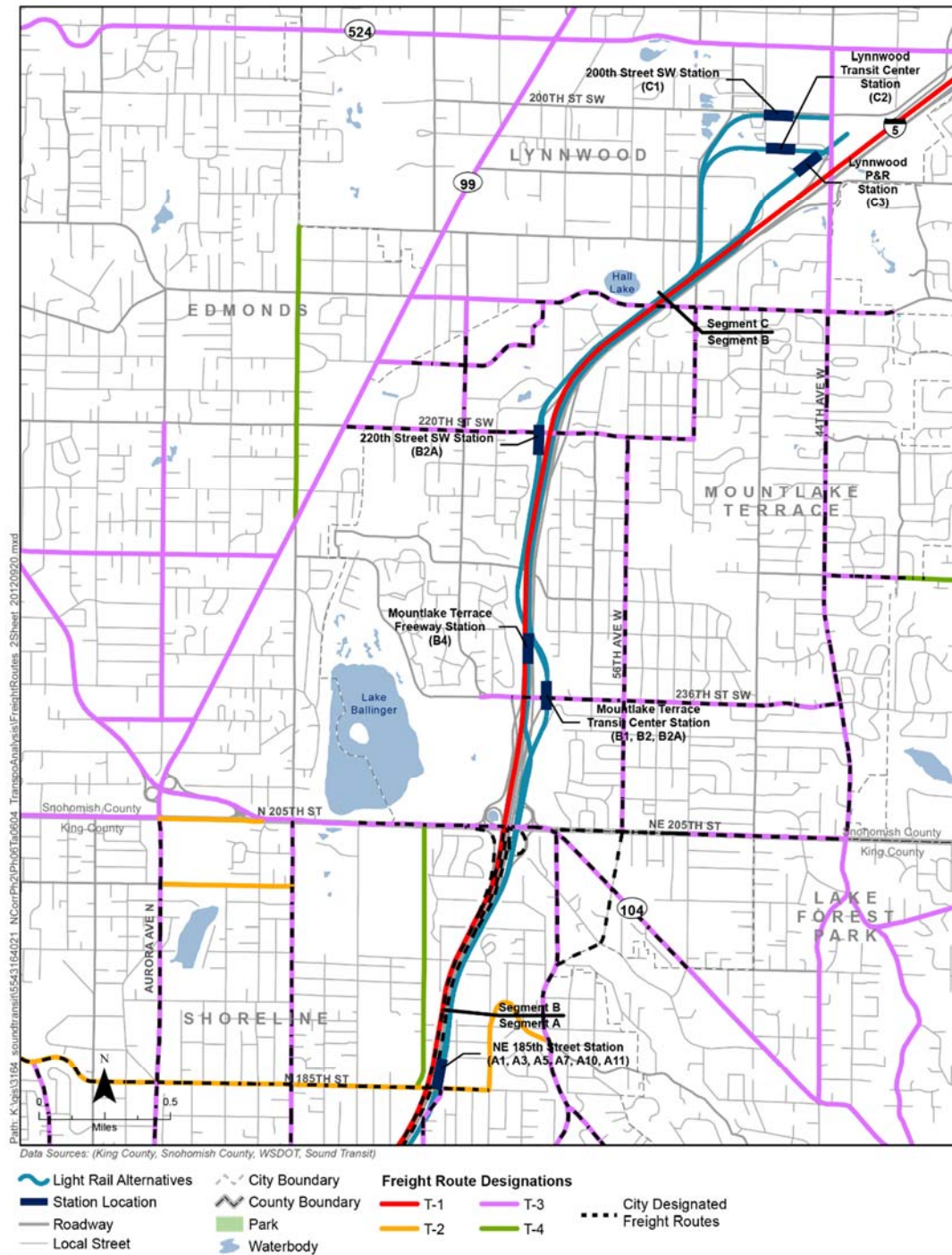


Figure 4-44. FGTS Classifications in Segments B and C

Segment C: Mountlake Terrace to Lynnwood

Freight routes in Segment C are identified by the FGTS. FGTS-classified freight routes within Lynnwood are shown in Figure 4-42. I-5 is the only roadway in Segment C designated as a T-1 route. Key roadways designated as T-3 routes are:

- 212th Street SW
- 196th Street SW (SR 524)
- 44th Avenue West

No additional roadways are designated as freight or truck routes by the City of Lynnwood.

4.7 Parking

Parking surveys were conducted to inventory the supply, parking restrictions, and midday use of on-street and off-street parking, including both private parking lots and park-and-ride lots. The survey was conducted within 0.25 mile of the proposed station locations, shown in Figure 4-43. Between stations, the parking survey was conducted within the footprint of the light rail alignments. Overall key observations and findings include the following:

- Existing parking utilization in the NE 130th Street/I-5 area is approximately 14 percent for both on-street and off-street parking, including the NE 133rd/5th Avenue NE Park-and-Ride lot, which is 24 percent utilized.
- Existing parking utilization in the NE 145th Street/I-5 area is approximately 27 percent for on-street and 71 percent for off-street parking, including the North Jackson Park Park-and-Ride lot, which is 94 percent utilized.
- Existing parking utilization in the NE 155th Street/I-5 area is approximately 17 percent for on-street and 25 percent for off-street parking.
- Existing parking utilization in the NE 185th Street/I-5 area is approximately 11 percent for on-street and 43 percent for off-street parking.
- Existing parking utilization in the Mountlake Terrace Transit Center and freeway station area is approximately 8 to 16 percent for on-street and 88 percent for off-street parking, including the Mountlake Terrace Park-and-Ride garage and surface lot, which is 93 percent utilized.
- Existing parking utilization in the 220th Street SW/I-5 area is approximately 11 percent for on-street and 52 percent for off-street parking.
- Existing parking utilization in the Lynnwood Transit Center area is approximately 44 to 100 percent for on-street and 57 to 68 percent for off-street parking, including the Lynnwood Park-and-Ride lot, which is 100 percent utilized.

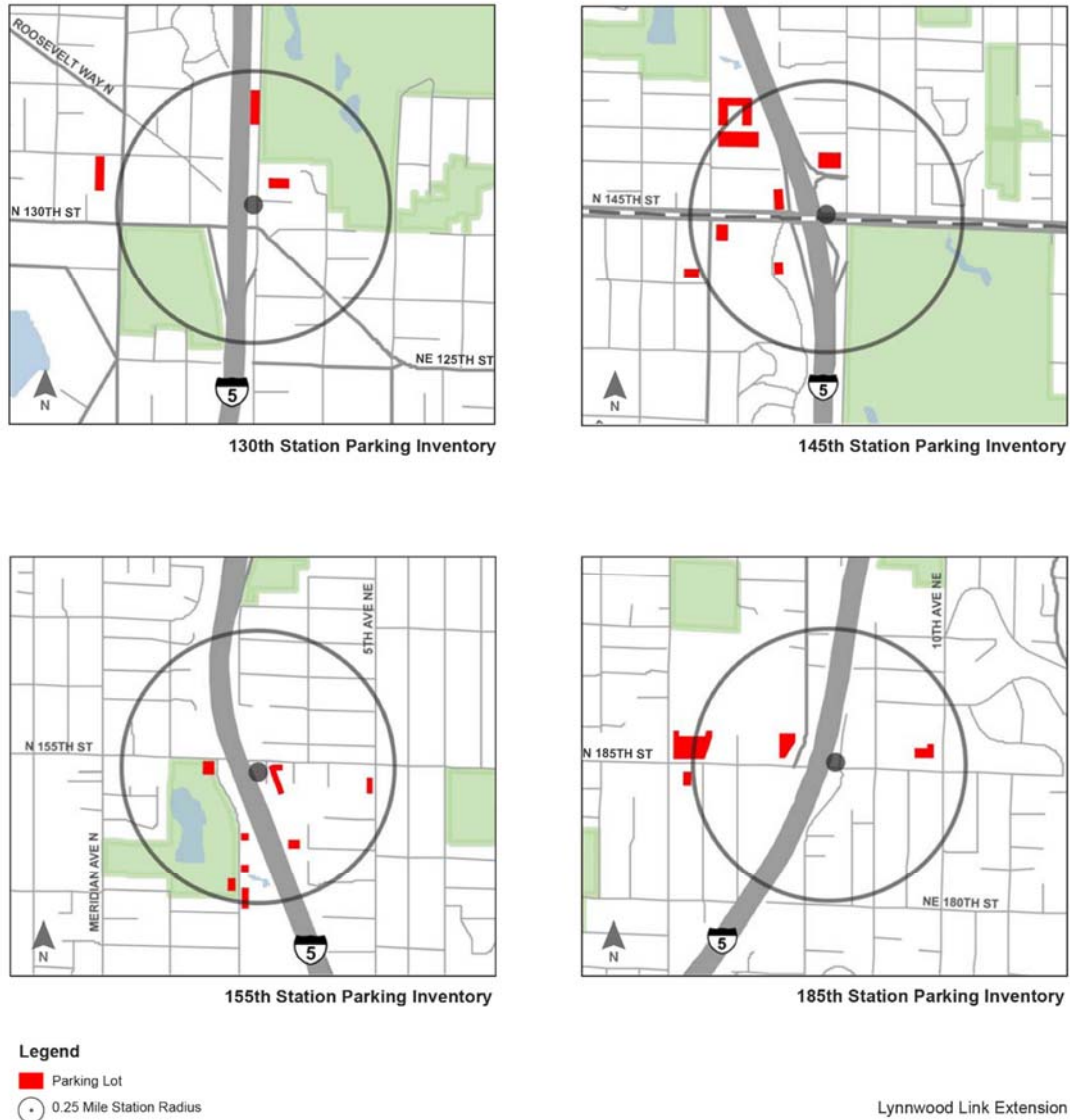


Figure 4-45. Areas Inventoried for Parking in Segment A

4.7.1 Segment A: Seattle to Shoreline

Table 4-23 summarizes the results of the parking survey within Segment A along the light rail alignment, which consists of NE 113th Street to NE 185th Street along the east side of I-5.

Table 4-23. Parking Supply and Utilization for Segment A

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	130	0	130	12	9%
Off-Street ^a	19	0	19	12	63%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

Within the survey area, on-street parking is available on a few streets that are within the proposed light rail alignment for a total of 130 spaces. The majority of the on-street parking spaces along the alignment are on 1st Avenue NE between NE 157th Street and 161st Street, and between NE 170th Street and NE 174th Street. As shown above in Table 4-22, the on-street parking utilization is 9 percent in this area based on field observations.

One off-street parking lot is available within the rail alignment and is located just north of NE 117th Street and east of I-5. This parking lot was 63 percent utilized.

NE 130th Street/I-5 Area

Table 4-24 summarizes the results of the parking survey within 0.25 mile of the proposed NE 130th Street Station. The parking survey area extends from approximately NE 125th Street to NE 135th Street and from 1st Avenue NE to 10th Avenue NE.

Table 4-24. Parking Supply and Utilization for NE 130th Street/I-5 Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	400	30	430	60	14%
Off-Street ^a	290 ^b	0	290	40 ^c	14%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride lot with 46 spaces.

^c Park-and-ride utilization source: King County Metro Transit Park and Ride Utilization Report, Second Quarter 2012.

The study area is mostly residential with single-family homes. A large park, North Acres Park, is located to the southwest and Jackson Park Golf Course is located to the northeast.

The majority of the residential streets in this area has on-street parking, with a total of 400 unrestricted parking spaces. No parking is allowed on NE 130th Street, Roosevelt Way North, and portions of 5th Avenue NE. In addition, 5th Avenue NE and 127th Avenue NE have time-restricted parking. On 5th Avenue NE, approximately 5 spaces are allocated for buses only from 5 am to 9 am, and an additional 18 spaces are provided for 4-hour parking from 7 am to 6 pm. There are nine spaces on the north side of 127th Avenue NE with 4-hour parking from 7 am

to 6 pm. As shown above in Table 4-23, the on-street parking utilization is 14 percent in this area based on field observations.

One off-street parking lot is within the study area. The NE 133rd/5th Avenue NE Park-and-Ride, located along 5th Avenue NE approximately 0.25 mile north of NE 130th Street, was 24 percent utilized.

NE 145th Street/I-5 Area

Table 4-25 summarizes the results of the parking survey within 0.25 mile of the NE 145th Street Station area. The parking survey area for the proposed NE 145th Street Station location extends from approximately NE 140th Street to NE 150th Street and from 1st Avenue NE to 10th Avenue NE.

Table 4-25. Parking Supply and Utilization for NE 145th Street/I-5 Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	450	0	450	120	27%
Off-Street ^a	350	0	350	250	71%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

The study area to the north of NE 145th Street is mostly residential with single-family homes. The Lakeside School is located to the southwest and the Jackson Park Golf Course to the southeast.

The majority of the residential streets in this area has on-street parking, with a total of 450 unrestricted parking spaces. No parking is allowed on NE 145th Street, 1st Avenue NE, and portions of 5th Avenue NE. As shown in Table 4-24, the on-street parking utilization was 27 percent in this inventory area.

A few off-street parking lots are available, including lots for Lakeside School, which were 100 percent utilized. The North Jackson Park-and-Ride lot, located along 5th Avenue NE just north of NE 145th Street, was 94 percent utilized.

NE 155th Street/I-5 Area

Table 4-26 summarizes the results of the parking surveys within 0.25 mile of the proposed NE 155th Street Station. The survey area extends from NE 150th Street to NE 159th Street and from Meridian Avenue North to 5th Avenue NE.

Table 4-26. Parking Supply and Utilization for NE 155th Street/I-5 Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	580	0	580	100	17%
Off-Street ^a	200	0	200	50	25%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

The study area is mostly residential with single-family homes, including a large park in the southwest and a couple of businesses.

The majority of the residential streets in this area has on-street parking, with a total of 580 unrestricted parking spaces. No parking is allowed on NE 155th Street, 1st Avenue NE, and portions of 5th Avenue NE. As shown in Table 4-25, the on-street parking utilization was 17 percent.

A few off-street parking lots are available with approximately 200 spaces. The off-street parking lots were 25 percent utilized. There are no existing park-and-ride lots in this area.

NE 185th Street/I-5 Area

Table 4-27 summarizes the results of the parking surveys within 0.25 mile of the proposed NE 185th Street Station. The survey area for the NE 185th Street Station extends from North 180th Street to North 190th Street and from 2nd Avenue NE to 10th Avenue NE.

Table 4-27. Parking Supply and Utilization for NE 185th Street/I-5 Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	700	0	700	80	11%
Off-Street ^a	300	0	300	130	43%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

The study area is mostly residential with single-family homes. The Shoreline Center is located in the northwest quadrant of the study area. The majority of the residential streets in this area has on-street parking, with a total of 700 unrestricted parking spaces. No parking is allowed on portions of NE 185th Street and portions of 5th Avenue NE. As shown in Table 4-26, the on-street parking utilization was 11 percent.

Off-street parking lots at the Shoreline Center were 58 percent utilized. Utilization of all off-street parking lots was 43 percent. There are no existing park-and-ride lots in this area.

4.7.2 Segment B: Shoreline to Mountlake Terrace

On-street or off-street parking is not available along the proposed light rail alignment between NE 185th Street and Mountlake Terrace beyond the station areas.

Mountlake Terrace Transit Center Area

Figure 4-44 shows the areas within 0.25 mile of each proposed station location for which the parking surveys for the proposed Mountlake Terrace Transit Center Station and the Mountlake Terrace Freeway Station, respectively, were conducted. The survey area for the Mountlake Terrace stations was from approximately 228th Street SW to 239th Street SW and from 66th Avenue West and 58th Avenue West. The survey area includes various uses: residential development, a golf course, the Mountlake Terrace Public Library, and the existing Mountlake Terrace Park-and-Ride. Tables 4-28 and 4-29 summarize the parking inventory results for these areas.

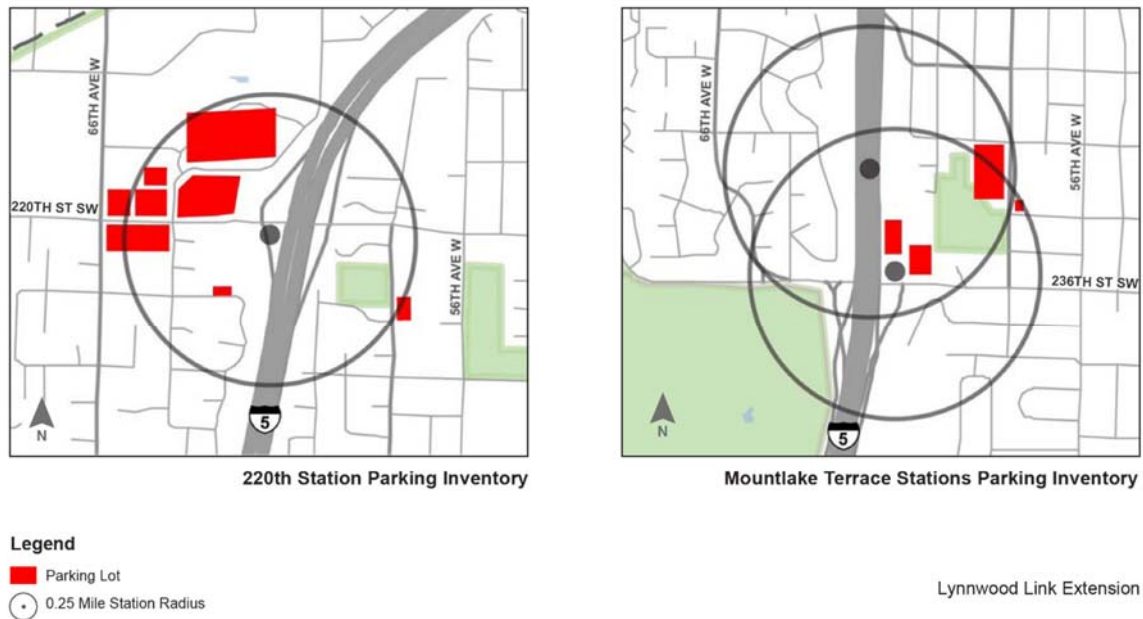


Figure 4-46. Area Inventoried for Segment B

Table 4-28. Parking Supply and Utilization for the Mountlake Terrace Transit Center Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	440	0	440	70	16%
Off-Street ^a	990 ^b	0	990	870 ^c	88%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride with 878 spaces.

^c Park-and-ride utilization source: Community Transit 2012 System Performance Report.

Table 4-29. Parking Supply and Utilization for the Mountlake Terrace Freeway Station Area

	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	640	0	640	50	8%
Off-Street ^a	990 ^b	0	990	870 ^c	88%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride with 878 spaces.

^c Park-and-ride utilization source: Community Transit 2012 System Performance Report.

On-street parking is available on the majority of the residential streets. No parking is allowed on 236th Street SW, and portions of 60th Avenue West and 64th Avenue West. As shown in Table 4-27, there were fewer on-street parking spaces within 0.25 mile of the Mountlake Terrace Transit Center and the utilization was higher at 16 percent. As shown in Table 4-28, the utilization of on-street parking within 0.25 mile of the Mountlake Terrace Freeway Station was 8 percent.

Off-street parking for the Mountlake Terrace Public Library was 49 percent utilized. The Mountlake Terrace Transit Center park-and-ride facility, which consists of 880 spaces in a garage and surface lot, was 93 percent utilized. The combined 990 parking spaces in the area were 88 percent utilized.

220th Street SW/I-5 Area

Table 4-30 summarizes the results of the parking survey within 0.25 mile of the proposed 220th Street SW Station area. The survey area for the 220th Street SW Station is approximately from 216th Street SW to 225th Place SW and from 66th Avenue West to 58th Avenue West.

Table 4-30. Parking Supply and Utilization for 220th Street SW/I-5 Area

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	610	0	610	70	11%
Off-Street ^a	1300	0	1300	680	52%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

The survey area south of 220th Street SW is mostly single-family homes with a school to the west of I-5 and a shopping center to the east of 66th Avenue West. The area north of 200th Street SW is a mix of commercial and multifamily homes, including two large apartment complexes.

On-street parking is available on the majority of the residential streets. No parking is allowed on 220th Street SW. As shown in Table 4-29, the on-street parking utilization was 11 percent. The off-street parking lots were 52 percent utilized. There are no existing park-and-ride lots in this station area.

4.7.3 Segment C: Mountlake Terrace to Lynnwood

Table 4-31 summarizes the results of the parking survey within the Segment C light rail alignment, not including the station areas. The parking survey area for the light rail alignment in Segment C is from 236th Street SW to 196th Street SW, along the west side of I-5 until 52nd Avenue West, and then along the east side of 52nd Avenue West.

Table 4-31. Parking Supply and Utilization for Segment C

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	30	0	30	7	23%
Off-Street ^a	305	0	300	235	77%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

On-street parking is available on 227th Street SW just west of I-5 and 204th Street SW east of Cedar Valley Road. The on-street parking utilization was 23 percent.

Two off-street parking lots are within the light rail alignment. One is north of 204th Street SW and east of 52nd Avenue West, and the other is north of 208th Street SW and east of 52nd Avenue West. These off-street parking lots were 77 percent utilized.

Lynnwood Transit Center Area

Figure 4-45 shows the station areas inventoried for Segment C. Table 4-32 summarizes the results of the parking survey within 0.25 mile of the proposed Lynnwood Park-and-Ride Station.



Figure 4-47. Areas Inventoried for Segment C

Table 4-32. Parking Supply and Utilization for Lynnwood Park-and-Ride Station

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	0	0	0	0	Not applicable
Off-Street ^a	3,020 ^b	0	3,020	2,050 ^c	68%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride with 1,370 spaces.

^c Park-and-ride utilization source: Community Transit 2011 Annual Park and Ride License Plate Survey Strategic Planning report.

The survey area for the Lynnwood Park-and-Ride Station extends from approximately the south side of I-5 to 200th Street SW and from 48th Avenue West to 44th Avenue West. The study area is a mix of uses—commercial, retail, multifamily residences, and the existing Lynnwood Park-and-Ride. There is no on-street parking in this area.

The Lynnwood Transit Center park-and-ride lot was 100 percent utilized. All of the off-street parking was 68 percent utilized.

Table 4-33 summarizes the results of the parking survey within 0.25 mile of the proposed Lynnwood Transit Center Station.

Table 4-33. Parking Supply and Utilization for Lynnwood Transit Center Station

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	10	0	0	10	100%
Off-Street ^a	3,720 ^b	0	3,720	2,410 ^c	65%

^a Data were collected in mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride with 1,370 spaces.

^c Park-and-ride utilization source: Community Transit 2011 Annual Park and Ride License Plate Survey Strategic Planning report.

The survey area for the proposed Lynnwood Transit Center Station extends from I-5 to 198th Street SW and from 50th Avenue West to 44th Avenue West. The study area is a mix of uses—commercial, retail, multifamily residences, and the existing Lynnwood Park-and-Ride lot.

On-street parking is only available on one block of 48th Avenue West, and all 10 parking spaces were utilized. The existing park-and-ride lot is 100 percent utilized. All of the off-street parking, including the park-and-ride, was 65 percent utilized during the survey.

Table 4-34 summarizes the results of the parking survey within 0.25 mile of the proposed 200th Street SW Station.

Table 4-34. Parking Supply and Utilization for 200th Street SW Station

Parking Type	Parking Supply			Midday Utilization	
	No Restrictions	Time-Restricted	Total	Parked Cars	Percent Utilization
On-Street ^a	90	0	90	40	44%
Off-Street ^a	4,420 ^b	0	4,420	2,510 ^c	57%

^a Data were collected mid-week in May 2012. Utilization was counted between 9 am and 11 am and between 1 pm and 4 pm.

^b Includes existing park-and-ride with 1,370 spaces.

^c Park-and-ride utilization source: Community Transit 2011 Annual Park and Ride License Plate Survey Strategic Planning report.

The survey area for the 200th Street SW Station is approximately from 204th Street SW to 196th Street SW and from 50th Avenue West to 44th Avenue West. The study area is a mix of uses—commercial, retail, multifamily residences, and the existing Lynnwood Park-and-Ride lot.

On-street parking is only available on one block of 48th Avenue West and one block on 50th Avenue West. The utilization was 44 percent.

The existing park-and-ride was 100 percent utilized. All of the off-street parking spaces were 57 percent utilized during the survey.

4.8 Safety

This section discusses current safety-related issues in the project corridor. Accident data for a 4-year period (2010 to 2013) for the study intersections were collected from WSDOT for both highway facilities and city streets. Accident data were reviewed for each study intersection to tally accidents by severity (fatality, injury or property damage only) for the analysis period and to develop an accident rate for the location. The accident rate (in accidents/year, along with traffic volumes) gives an indication of high accident occurrence. The City of Seattle identifies collision analysis locations (CALs) for future safety improvements at signalized intersections experiencing more than 10 collisions per year, and at unsignalized intersections with 5 collisions per year. For other jurisdictions, locations where the accident rate is at or exceeds 1.0 accident per million entering vehicles were identified as CALs.

Key observations and findings include the following:

- In Segment A, 11 CALs were identified near the I-5/NE 130th Street and I-5/NE 145th Street interchanges, at intersections along NE 145th Street, and at locations on Aurora Avenue North.
- In Segment B, two intersections located near the 220th Street SW Station vicinity currently meet CAL criteria.
- In Segment C, eight intersections near the Lynnwood Transit Center currently meet CAL criteria.

The dominant accident type for each CAL is noted in the safety review that follows for the local intersections.

4.8.1 I-5 Ramps and Ramp Terminals

Accident data were provided by WSDOT for I-5 ramps within the corridor study area.

Table 4-35 summarizes the accident data collected for the I-5 ramps extending from the Northgate interchange to the SR 524 interchange at 196th Street SW in Lynnwood (MP 170 to 182). Table 4-35 identifies each study area segment and station areas. Ramp accident data were combined with city street and state route accident data, which are summarized in Section 4.8.2 for local intersections.

Along I-5, between 80 and 85 percent of the accidents were congestion-related, involving rear-end collisions from slowing or stopped traffic, or sideswipe collisions from merge or weave movements, and these occurred most often during peak periods. Other collisions, involving vehicles leaving the roadway, and fixed object collisions, made up the remaining accidents, and tended to occur during nighttime hours.

Table 4-35. I-5 Ramp Accident Data

Interchange Areas and Ramps	ADT	2010-2013 Accident Data			Yearly Accident Average
		PDO	INJ	FAT	
Segment A					
Northgate - NB off ramp to 1st at NE 107th	14,910	4.75	2.50	0.00	7.25
Northgate - ramp at Rev Express Lanes at NE 103rd	4,240	4.00	2.50	0.00	6.50
Northgate - NB on ramp (from 107th and north of NG Way)	13,290	4.00	0.75	0.00	4.75
Northgate - NB on ramp (from Northgate Way)	3,960	1.50	0.75	0.00	2.25
Northgate - SB CD off ramp	14,530	2.75	1.50	0.00	4.25
Northgate - SB off ramp to Northgate Way (westbound)	7,870	3.75	1.00	0.00	4.75
Northgate - SB on ramp (from Northgate Way)	5,480	2.00	1.50	0.00	3.50
Northgate - SB off ramp to Northgate Way (eastbound)	6,140	3.50	1.75	0.00	5.25
Northgate Way between ramps	30,600	10.25	6.25	0.00	16.50
Northgate - Reversible Lanes	35,660	67.25	39.50	0.00	106.75
Northgate - SB on ramp (from Northgate Way to I-5)	6,420	2.50	0.75	0.00	3.25
NE 130th - NB off ramp to 5th	8,100	2.75	1.75	0.00	4.50
NE 130th - SB on ramp at 130th	7,630	1.25	0.50	0.00	1.75
NE 130th Street between ramps	-	2.75	1.75	0.00	4.50
NE 145th - NB off ramp to 5th	11,940	3.75	1.75	0.00	5.50
NE 145th - NB transit slip ramp (between off and on ramp)	20	0.00	0.00	0.00	0.00
NE 145th - NB transit slip ramp to 5th Ave NE	20	0.00	0.00	0.00	0.00
NE 145th - NB on ramp from 5th, n/o 145th	10,680	3.00	2.75	0.00	5.75
NE 145th - SB off ramp to 145th	12,190	3.50	1.75	0.00	5.25
NE 145th - SB transit slip ramp		0.00	0.00	0.00	0.00
NE 145th - SB on ramp from 145th	10,940	1.00	0.25	0.00	1.25

Table 4-35. I-5 Ramp Accident Data

Interchange Areas and Ramps	ADT	2010-2013 Accident Data			Yearly Accident Average
		PDO	INJ	FAT	
KC Metro Base - NB off ramp	400	0.00	0.00	0.00	0.00
KC Metro Base - NB roadway (between Base and 175th)	610	0.00	0.00	0.00	0.00
KC Metro Base - between ramps		0.25	0.00	0.00	0.25
KC Metro Base - SB off ramp	510	0.00	0.00	0.00	0.00
KC Metro Base - SB on ramp	500	0.00	0.00	0.00	0.00
NE 175th - NB off ramp	14,490	1.75	1.75	0.00	3.50
NE 175th - NB on ramp	8,640	0.50	0.75	0.00	1.25
NE 175th Street between ramps		7.00	3.50	0.00	10.50
NE 175th - SB off ramp	6,670	1.50	0.50	0.00	2.00
NE 175th - SB on ramp	9,250	0.75	0.00	0.00	0.75
Segment B					
SR 104/NE 205th St NB off ramp (eastbound)	4,080	1.25	0.25	0.00	1.50
SR 104/NE 205th St NB off ramp (westbound)	7,550	0.75	0.00	0.00	0.75
SR 104/NE 205th St NB on ramp (eastbound)	8,070	0.50	1.00	0.00	1.50
SR 104/NE 205th St NB on ramp (westbound)	5,500	1.25	0.25	0.00	1.50
NB CD SR 104/NE 205th to 236th Street SW	13,950	8.00	3.75	0.00	11.75
236th St SW - NB off ramp	4,650	1.25	0.00	0.00	1.25
MLT Freeway Station - NB off ramp		0.00	0.00	0.00	0.00
MLT Freeway Station - NB on ramp		0.00	0.00	0.00	0.00
MLT Freeway Station - SB off ramp		0.00	0.25	0.00	0.25
MLT Freeway Station - SB on ramp		0.00	0.00	0.00	0.00
236th St SW between ramps		0.50	0.50	0.00	1.00
236th St SW - SB on ramp	4,190	1.50	1.00	0.00	2.50
SR 104 - SB CD 236th St SW to SR 104/NE 205th St	13,860	2.00	0.25	0.00	2.25
236th SB Slip ramp to SR 104/NE 205th St	2,750	0.00	0.00	0.00	0.00
SR 104/NE 205th St SB off ramp (westbound right)	16,610	0.25	0.00	0.00	0.25
SR 104/NE 205th St SB on ramp (westbound GP traffic)	3,450	2.25	0.50	0.00	2.75
SR 104/NE 205th St SB on ramp (HOV traffic - both directions)	1,160	0.00	0.00	0.00	0.00
SR 104/NE 205th St SB on ramp (eastbound GP traffic)	7,370	2.25	1.50	0.00	3.75
220th St SW - NB off ramp	8,550	0.25	0.25	0.00	0.50
220th St SW - NB on ramp	15,110	2.25	0.75	0.00	3.00
220th St SW between ramps	-	8.00	1.50	0.00	9.50
220th St SW - SB off ramp	12,610	4.50	1.25	0.00	5.75
220th St SW - SB on ramp	8,550	1.75	0.50	0.00	2.25
Segment C					
Lynnwood TC Direct Access - Ramp	4,140	1.50	0.50	0.00	2.00
Lynnwood TC Direct Access - NB off ramp	1,450	0.25	0.25	0.00	0.50
Lynnwood TC Direct Access - NB on ramp	950	0.00	0.00	0.00	0.00
Lynnwood TC Direct Access - SB off ramp	1,330	0.00	0.00	0.00	0.00
Lynnwood TC Direct Access - SB on ramp	1,360	0.00	0.00	0.00	0.00
44th Ave W - NB off ramp	12,540	4.00	0.50	0.00	4.50
44th Ave W - SB on ramp	11,700	1.75	1.00	0.00	2.75
44th Ave W between ramps		7.00	3.00	0.00	10.00

Table 4-35. I-5 Ramp Accident Data

Interchange Areas and Ramps	ADT	2010-2013 Accident Data			Yearly Accident Average
		PDO	INJ	FAT	
Poplar Way - NB off ramp	7,680	1.00	0.75	0.00	1.75
Poplar Way - NB on ramp	17,280	3.75	0.25	0.00	4.00
196th St SW - NB on ramp	5,810	1.50	0.25	0.00	1.75
196th St SW - SB off ramp (eastbound)	7,070	2.50	0.75	0.00	3.25
196th St SW - SB off ramp (westbound)	15,730	5.00	0.75	0.00	5.75
196th St SW - SB on ramp	8,870	2.50	0.50	0.00	3.00

4.8.2 Local Intersections

Accident rates were calculated for the study intersections as the number of accidents per million entering vehicles (acc/MEV). Tables 4-35 through 4-38 list the intersection locations for each station area under consideration, indicating intersection traffic volumes, accident averages, and accident rates for the intersections. These are also shown on the map in Figure 4-46. Accident data for local intersections were compiled for city streets, state routes (SR 99, SR 522, SR 523, SR 524), and I-5 ramps.

The City of Seattle uses a system in which a CAL is identified for future safety improvements. In evaluating the accident rates, a signalized intersection in Seattle is considered a CAL with more than 10 collisions per year, on average, and an unsignalized intersection is considered a CAL with 5 collisions per year, on average.

For other jurisdictions, an intersection is considered a CAL where the accident rate is at or exceeds 1.0 acc/MEV.

Accident types observed are noted for each CAL listed among the study intersections.

Segment A: Seattle to Shoreline

Accident data and rates for Seattle and Shoreline intersections are presented in Tables 4-36 and 4-37, respectively. Any intersections that are identified as CAL, either along the guideway or near the proposed light rail stations, are discussed below.

Table 4-36. Segment A, City of Seattle Intersection Accident Data

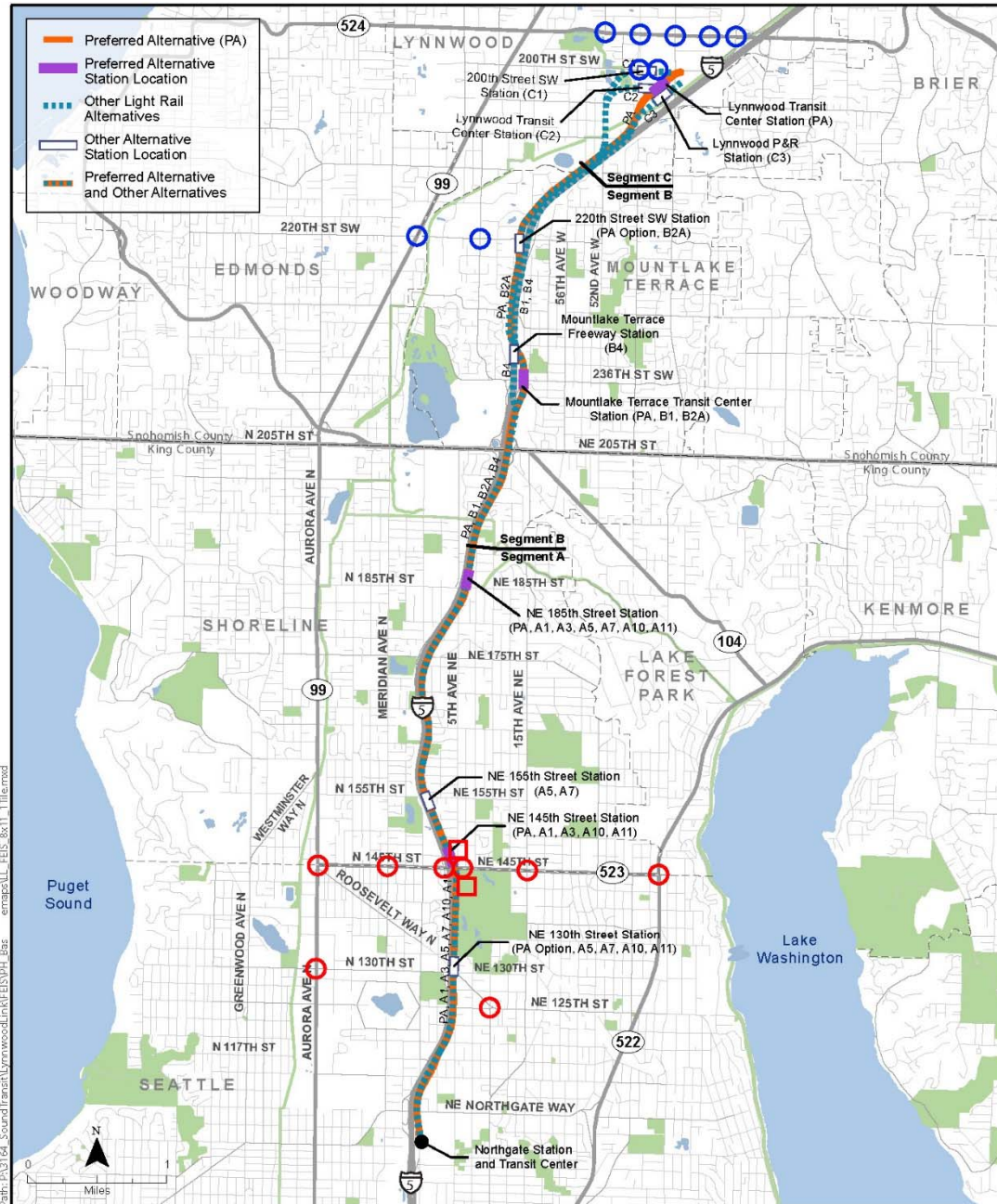
Intersection	PM Peak Hour Entering Volume	ADT	2010-2013, 4 Year Average			Yearly Accident Average	Accident Rate (acc/MEV)
			PDO	INJ	FAT		
N Northgate Way at 1st Avenue NE*	4375	43,750	2.50	1.25	0	3.75	0.23
Northgate Way between ramps	3060	30,600	10.25	6.25	0	16.50	1.48
NE 103rd Street at 1st Avenue NE at I-5 Express Lanes On- Off-Ramps*	2085	20,850	5.00	2.75	0	7.75	1.02
N 117th Street at 1st Avenue NE	653	6,530	0.25	0.50	0	0.75	0.31
NE 125th Street at 15th Avenue NE	3114	31,140	8.25	4.25	0	12.50	1.10
NE 127th Street at 8th Ave NE/Roosevelt Way NE	1565	15,650	1.75	1.00	0	2.75	0.48
Roosevelt Way NE at 10th Avenue NE	1664	16,640	0.00	0.00	0	0.00	0.00
NE 125th Street at 5th Avenue NE	894	8,940	0.75	1.25	0	2.00	0.61
NE 127th Street at 5th Avenue NE	736	7,360	0.25	0.00	0	0.25	0.09
I-5 Northbound Off-Ramp at 5th Avenue NE *	1271	12,710	2.75	1.75	0	4.50	0.97
NE 130th Street at 5th Ave NE/Roosevelt Wy NE	2611	26,110	0.25	3.50	0	8.25	0.87
NE 130th Street at I-5 Southbound On-Ramp *	2061	20,610	1.25	0.50	0	1.75	0.23
NE 130th Street at 3rd Avenue NE	2061	20,610	0.50	0.00	0	1.00	0.13
NE 130th Street at 1st Avenue NE	2418	24,180	1.50	2.25	0	3.75	0.42
N 130th Street at Corliss Avenue N	1591	15,910	0.00	0.00	0	0.00	0.00
N 130th Street at Meridian Avenue N	1887	18,870	0.75	2.50	0	3.25	0.47
N 130th Street at Aurora Avenue N*	4198	41,980	8.00	7.00	0	15.00	0.98
N 145th Street at Aurora Avenue N*	4245	42,450	9.00	5.50	0.25	14.75	0.95
N 145th Street at Meridian Avenue N*	2358	23,580	5.75	6.00	0	11.75	1.37
N 145th Street at Corliss Avenue N*	1915	19,150	0.00	0.25	0	0.25	0.04
NE 145th Street at 1st Avenue NE*	2519	25,190	3.00	2.75	0	5.75	0.63
NE 145th Street at 3rd Avenue NE*	2243	22,430	1.00	0.00	0	1.00	0.12
NE 145th Street at 4th Avenue NE*	2252	22,520	0.25	0.50	0	0.75	0.09
NE 145th Street at I-5 Southbound Ramps*	2911	29,110	8.25	5.50	0	13.75	1.29
NE 145th Street at 5th Avenue NE*	3700	37,000	9.00	5.25	0	14.25	1.06
5th Avenue NE at I-5 Northbound Off-Ramp *	1374	13,740	3.75	1.75	0	5.50	1.10
5th Avenue NE at I-5 Northbound Transit-Only Off- Ramp/Northbound On-Ramp*	1331	13,310	3.00	2.75	0	5.75	1.18
5th Avenue NE at North Jackson Park-and-Ride	716	7,160	0.00	0.00	0	0.00	0.00
NE 145th Street at 6th Avenue NE*	2408	24,080	1.25	0.25	0	1.50	0.17
NE 145th Street at 8th Avenue NE*	2457	24,570	1.25	0.75	0	2.00	0.22
NE 145th Street at 10th Avenue NE*	2405	24,050	0.00	0.00	0	0.00	0.00
NE 145th Street at 12th Avenue NE*	2388	23,880	1.00	0.50	0	1.50	0.17
NE 145th Street at 15th Avenue NE*	3645	36,450	10.75	4.25	0	15.00	1.13

* I-5 ramp and SR facility accident data included in intersection accident summary

Table 4-37. Segment A, City of Shoreline Intersection Accident Data

Intersection	PM Peak Hour Entering Volume	ADT	2010-2013, 4 Year Average			Yearly Accident Average	Accident Rate (acc/MEV)
			PDO	INJ	FAT		
N 155th Street at Aurora Avenue N*	3631	36,310	7.50	4.50	0	12.00	0.91
N 155th Street at Ashworth Avenue N	1221	12,210	0.00	0.25	0	0.25	0.06
N 155th Street at Meridian Avenue N	1804	18,040	2.75	1.25	0	4.00	0.61
N 155th Street at Corliss Avenue N	1074	10,740	0.00	0.00	0	0.00	0.00
NE 155th Street at 1st Avenue NE	1194	11,940	1.00	0.50	0	1.50	0.34
NE 155th Street at 3rd Avenue NE	1037	10,370	0.25	0.50	0	0.75	0.20
NE 155th Street at 4th Avenue NE	997	9,970	0.00	0.00	0	0.00	0.00
NE 155th Street at 5th Avenue NE	1493	14,930	2.25	1.00	0	3.25	0.60
NE 155th Street at 6th Avenue NE	849	8,490	0.00	0.00	0	0.00	0.00
NE 155th Street at 8th Avenue NE	946	9,460	0.50	0.00	0	0.50	0.14
NE 155th Street at 10th Avenue NE	864	8,640	0.25	0.50	0	0.75	0.24
NE 155th Street at 12th Avenue NE	800	8,000	0.50	0.75	0	1.25	0.43
NE 155th Street at 15th Avenue NE	1974	19,740	1.50	2.00	0	3.50	0.49
NE 161st Street at 1st Avenue NE	-	-	0.00	0.00	0	0.00	N/A
NE 165th Street at 5th Avenue NE	764	7,640	0.50	0.25	0	0.75	0.27
NE 159th Street at 1st Avenue NE	-	-	0.00	0.00	0	0.00	N/A
NE 174th Street at 1st Avenue NE	-	-	0.00	0.00	0	0.00	N/A
NE 175th Street at 5th Avenue NE	1797	17,970	3.25	1.50	0	4.75	0.72
NE 175th Street at I-5 Northbound Ramps *	2560	25,600	2.25	2.50	0	4.75	0.51
NE 175th Street at I-5 Southbound Ramps *	2634	26,340	2.25	0.50	0	2.75	0.29
N 175th Street at Meridian Avenue N	2960	29,600	7.00	2.75	0	9.75	0.90
N 175th Street at Aurora Avenue N*	3172	31,720	7.00	3.00	0	10.00	0.86
NE 180th Street at 15th Avenue NE	1737	17,370	2.00	0.75	0	2.75	0.43
NE 180th Street at 10th Avenue NE	596	5,960	1.00	0.00	0	1.00	0.46
NE 180th Street at 5th Avenue NE	409	4,090	0.75	0.00	0	0.75	0.50
N 180th Street at Meridian Avenue N	1082	10,820	0.75	0.50	0	1.25	0.32
NE Perkins Way at 15th Avenue NE	1399	13,990	2.25	0.50	0	2.75	0.54
N 185th Street at Aurora Avenue N*	3413	34,130	6.00	3.25	0	9.25	0.74
N 185th Street at Meridian Avenue N	2037	20,370	3.75	2.00	0	5.75	0.77
N 185th Street at Corliss Avenue N	1074	10,740	0.50	0.00	0	0.50	0.13
NE 185th Street at 1st Avenue NE	2231	22,310	1.00	0.25	0	1.25	0.15
NE 185th Street at 2nd Avenue NE	1032	10,320	0.00	0.00	0	0.00	0.00
NE 185th Street at 3rd Avenue NE	1020	10,200	0.00	0.00	0	0.00	0.00
NE 185th Street at 5th Avenue NE	1082	10,820	2.00	0.50	0	2.50	0.63
NE 185th street at 7th Avenue NE	1154	11,540	0.00	0.00	0	0.00	0.00
NE 185th Street at 8th Avenue NE	835	8,350	0.25	0.25	0	0.50	0.16
NE 185th Street at 9th Avenue NE	764	7,640	0.00	0.00	0	0.00	0.00

* I-5 ramp and SR facility accident data included in intersection accident summary



Collision Analysis Locations

- In Seattle, signalized locations with greater than 10 collisions per year
- In Seattle, unsignalized locations with greater than 5 collisions per year
- All other jurisdictions, signalized locations with greater than 1.0 accidents per million entering vehicles (MEV)
- All other jurisdictions, unsignalized locations with greater than 1.0 accidents per million entering vehicles (MEV)

Figure 4-48. Existing Collision Analysis Locations in Study Area

Northgate Station Area

All light rail alternatives will connect to the Northgate Station and elevated guideway, and extend north by crossing Northgate Way and following 1st Avenue NE to North 117th Street and to 5th Avenue NE at NE 125th Street. Accident data for the Northgate study intersections are summarized in Table 4-35.

According to City of Seattle data, one location would be classified as CAL in the Northgate Station area:

- Northgate Way between ramps: 16.5 average accidents/year, 1.48 acc/MEV; the safety issue at this location appears to be congestion with predominantly rear-end type accidents.

Bicycle collisions were recorded on North Northgate Way between ramps (one collision) and on North 117th Street at 1st Avenue NE (one collision).

NE 130th Street/I-5 Area

According to City of Seattle data, one location would classify as CAL in the station study area:

- NE 130th Street at Aurora Avenue North: 15 average accidents/year, 0.98 acc/MEV; the safety issue at this location appears to be congestion with high rear-end, right-angle and left-turn accidents plus pedestrian and bicycle accidents.

The I-5 northbound off-ramp to NE 130th Street at 5th Avenue NE is a stop-controlled ramp where right-angle and rear-end collisions are prevalent. This location had previously been identified as a CAL, but currently is not one.

Pedestrian collisions were recorded at NE 125th Street and 15th Avenue NE (one collision) and at NE 130th Street and Aurora Avenue North (four collisions).

Bicycle collisions were recorded at NE 127th Street/8th Avenue NE/Roosevelt Way NE (one collision), NE 130th Street at 1st Avenue NE (one collision) and NE 130th Street and Aurora Avenue North (one collision).

NE 145th Street/I-5 Area

The NE 145th Street Station area lies just north of the Seattle-Shoreline boundary. Many of the study intersections lie along SR 523, also known as North/NE 145th Street. Accident data were collected from WSDOT for city intersections, I-5 ramps, and SR 523.

According to City of Seattle data, six signalized intersections would be classified as CALs for the NE 145th Street Station study area:

- North 145th Street at Aurora Avenue North: 14.75 average accidents/year, 0.95 acc/MEV; safety issue appears to be congestion with predominantly

rear-end, right-angle and left-turn type accidents plus pedestrian and bicycle accidents.

- North 145th Street at Meridian Avenue North: 11.75 average accidents/year, 1.37 acc/MEV; safety issue appears to be congestion with predominantly rear-end, left-turn and right-angle accidents with pedestrian accidents. The intersection has existing two-phase signal without left-turn pockets.
- NE 145th Street at I-5 Southbound ramps: 13.75 average accidents/year, 1.29 acc/MEV; safety issue appears to be congestion with predominantly rear-end accidents.
- NE 145th Street at 5th Avenue NE: 14.25 average accidents/year, 1.06 acc/MEV; safety issue appears to be congestion with predominantly left-turn, rear-end and right-angle accidents with pedestrian accidents.
- NE 145th Street at 15th Avenue NE: 15 average accidents/year, 1.13 acc/MEV; safety issue appears to be congestion with rear-end and right-angle accidents and pedestrian accidents.
- NE 145th Street at Bothell Way NE: 13 average accidents/year, 0.81 acc/MEV; safety issue appears to be congestion with rear-end, sideswipe, right-angle and pedestrian accidents.

Two stop-controlled ramp intersections could also be considered CALs near the NE 145th Street Station:

- I-5 northbound off-ramp to NE 145th Street at 5th Avenue NE: 5.5 average accidents/year, 1.10 acc/MEV; safety issue appears to be congestion with predominantly rear-end and right-angle accidents at the ramp terminus. Fifth Avenue NE traffic stops for the ramp traffic.
- I-5 northbound transit off-ramp and general purpose on-ramp at 5th Avenue NE: 5.75 average accidents/year, 1.18 acc/MEV; safety issue appears to be left-turn and rear-end accidents, with high turning traffic to on ramp that must yield to through traffic.

Factors explaining why these intersections exhibit a higher accident rate were not evaluated; accident experiences at each intersection are briefly summarized below. The North 145th Street/Aurora Avenue North intersection experiences a high number of rear-end and right-angle accidents. The North 145th Street at Meridian Avenue North intersection experiences a high number of rear-end, left-turn, and right-angle accidents. The NE 145th Street at I-5 southbound ramps intersection experiences a high number of left-turn and right-angle accidents. The NE 145th Street at 5th Avenue NE intersection experiences a high number of rear-end, left-turn, right-angle, and sideswipe accidents. The NE 145th Street at 15th Avenue NE intersection experiences a high number of rear-end and right-angle accidents. The NE 145th Street at Bothell Way intersection experiences a high number of rear-end and right-angle accidents.

Two pedestrian accidents and one fatal pedestrian accident occurred at North 145th Street and Aurora Avenue North. Pedestrian accidents were also recorded at NE 145th Street at 15th Avenue NE (two), and NE 145th Street at Bothell Way (three). Bicycle accidents occurred at North 145th Street and Aurora Avenue North (one), and NE 145th Street at 1st Avenue NE (one).

NE 155th Street/I-5 Area

Pedestrian accidents occurred at North 155th Street and Aurora Avenue North (one), North 155th Street and Meridian Avenue North (three), and NE 155th Street at 10th Avenue NE (one).

One bicycle accident occurred at North 155th Street and Aurora Avenue North.

NE 185th Street/I-5 Area

Bicycle accidents occurred at North 175th Street at Meridian Avenue North (one), NE 175th Street at I-5 northbound ramps (one), and North 185th Street at Meridian Avenue North (one).

Segment B: Shoreline to Mountlake Terrace

Accident data and rates for Mountlake Terrace intersections are presented in Table 4-38. Any intersections that are identified as CAL, either along the light rail guideway or near the proposed light rail stations, are discussed below.

Table 4-38. Segment B, City of Mountlake Terrace Intersection Accident Data

Intersection	PM Peak Hour Entering Volume	ADT	2010-2013, 4 Year Average			Yearly Accident Average	Accident Rate (acc/MEV)
			PDO	INJ	FAT		
222nd Street SW at 64th Avenue W	249	2,490	0.00	0.00	0	0.00	0.00
220th Street SW at SR 99*	4757	47,570	19.50	10.00	0	29.50	1.70
220th Street SW at 70th Avenue W	2177	21,770	3.25	2.25	0	5.50	0.69
220th Street SW at 66th Avenue W	3266	32,660	9.00	3.25	0	12.25	1.03
220th Street SW at 64th Avenue W	3265	32,650	3.75	3.50	0	7.25	0.61
220th Street SW at I-5 Southbound Ramps *	3238	32,380	6.25	2.00	0	8.25	0.70
220th Street SW at I-5 Northbound Ramps *	2662	26,620	2.50	1.00	0	3.50	0.36
220th Street SW at 58th Avenue W	1216	12,160	2.00	0.75	0	2.75	0.62
220th Street SW at 56th Avenue W	1312	13,120	2.50	1.00	0	3.50	0.73
220th Street SW at 55th Avenue W	887	8,870	0.00	0.00	0	0.00	0.00
220th Street SW at 54th Avenue W	896	8,960	0.25	0.50	0	0.75	0.23
220th Street SW at 53rd Avenue W	851	8,510	0.00	0.00	0	0.00	0.00
220th Street SW at 52nd Avenue W	860	8,600	0.75	0.50	0	1.25	0.40
236th Street SW (Lakeview Dr) at 64th Avenue W	736	7,360	0.50	0.25	0	0.75	0.28
236th Street SW (Lakeview Dr) at I-5 Southbound On-Ramp *	1056	10,560	1.50	1.00	0	2.50	0.65
236th Street SW at I-5 Northbound Off-Ramp and Mountlake Terrace Park-and-Ride *	1547	15,470	1.50	0.00	0	1.50	0.27
236th Street SW at 58th Avenue W	1180	11,800	2.75	0.50	0	3.25	0.75

* I-5 ramp and SR facility accident data included in intersection accident summary

Mountlake Terrace Transit Center Area

In Mountlake Terrace near the Mountlake Terrace Transit Center, there are no CALs at any of the study intersections.

No pedestrian or bicycle accidents occurred at study intersections.

220th Street SW/I-5 Area

Two study intersections meet CAL criteria near the proposed 220th Street SW Station location:

- 220th Street SW at SR 99: 29.5 average accidents/year, 1.7 acc/MEV; safety issue appears to be congestion with predominantly rear-end and right-angle accidents where 6 pedestrian and one bicycle accidents occurred.
- 220th Street SW at 66th Avenue West: 12.25 average accidents/year, 1.03 acc/MEV; safety issue appears to be congestion with predominantly left-turn, rear-end and right-angle accidents.

Factors explaining why these intersections exhibit a higher accident rate were not evaluated. 220th Street SW at SR 99 experienced a high number of rear-end, sideswipe, and right-angle accidents, and 220th Street SW at 66th Avenue West experienced a high number of rear-end and left-turn accidents.

Six pedestrian collisions and one bicycle collision were reported at 220th Street SW at SR 99. One pedestrian collision was reported at 220th Street SW at 52nd Avenue West.

Segment C: Mountlake Terrace to Lynnwood

Accident data and rates for Lynnwood intersections are presented in Table 4-39. Any intersections that are identified as CALs, either along the proposed light rail guideway or near the light rail stations, are discussed below.

Table 4-39. Segment C, City of Lynnwood Intersection Accident Data

Intersection	PM Peak Hour Entering Volume	ADT	2010-2013, 4 Year Average			Yearly Accident Average	Accident Rate (acc/MEV)
			PDO	INJ	FAT		
200th Street SW at 50th Avenue W	1783	17,830	4.75	1.25	0	6.00	0.92
200th Street SW at 48th Avenue W	1936	19,360	9.50	5.50	0	15.00	2.12
200th Street SW at 46th Avenue W	1879	18,790	8.75	2.50	0	11.25	1.64
200th Street SW at 44th Avenue W	4011	40,110	3.25	0.75	0	4.00	0.27
204th Street SW at 52nd Avenue W	808	8,080	0.00	0.00	0	0.00	0.00
208th Street SW at 52nd Avenue W	1050	10,500	1.00	0.25	0	1.25	0.33
212th Street SW at 52nd Avenue W	1970	19,700	2.75	1.00	0	3.50	0.49
I-5 Direct Access at 46th Avenue W *	779	7,790	1.50	0.50	0	2.00	0.70
I-5 Southbound On-Ramp at 44th Avenue W*	3066	30,660	1.75	1.00	0	2.75	0.25
204th Street SW at 44th Avenue W, 44th between ramps*	2546	25,460	7.00	3.00	0	10.00	1.08
I-5 Northbound Off-Ramp at 44th Avenue W *	2917	29,170	4.00	0.50	0	4.50	0.42
Alderwood Mall Blvd at 40th Avenue W	1630	16,300	4.00	0.50	0	4.50	0.76
196th Street SW at 52nd Avenue W	2655	26,550	6.50	3.50	0	10.00	1.03
196th Street SW at 50th Avenue W	2704	27,040	5.50	0.50	0	6.00	0.61
196th Street SW at 48th Avenue W	3081	30,810	9.25	5.75	0	15.00	1.33
196th Street SW at 44th Avenue W	4253	42,530	14.25	4.00	0	18.25	1.18
196th Street SW at 40th Avenue W	3308	33,080	14.00	5.00	0	19.00	1.57
196th Street SW at 36th Avenue W*	4120	41,200	27.00	8.50	0	35.50	2.36
196th Street SW at Poplar Way*	3390	33,900	5.25	2.00	0	7.25	0.59
198th Street SW at 44th Avenue W	2050	20,500	0.50	0.00	0	0.50	0.07

* I-5 ramp and SR facility accident data included in intersection accident summary

Lynnwood Transit Center Area

Eight study intersections meet CAL criteria near the Lynnwood Transit Center:

- 204th Street SW at 44th Avenue West (between ramps): 10 average accidents/year, 1.08 acc/MEV; safety issue appears to be congestion with predominantly rear-end accidents.
- 200th Street SW at 48th Avenue West: 15 average accidents/year, 2.12 acc/MEV; safety issue appears to be congestion with predominantly rear-end and right-angle accidents with pedestrian accidents.

- 200th Street SW at 46th Avenue West: 11.25 average accidents/year, 1.64 acc/MEV; safety issue appears to be congestion with predominantly rear-end, right-angle, sideswipe and left-turn accidents.
- 196th Street SW at 52nd Avenue West: 10 average accidents/year, 1.03 acc/MEV; safety issue appears to be congestion with predominantly rear-end, right-angle and left-turn accidents.
- 196th Street SW at 48th Avenue West: 15 average accidents/year, 1.33 acc/MEV; safety issue appears to be congestion with predominantly left-turn, rear-end and right-angle accidents plus pedestrian and bicycle accidents.
- 196th Street SW at 44th Avenue West: 18.25 average accidents/year, 1.18 acc/MEV; safety issue appears to be congestion with predominantly rear-end, right-angle, sideswipe and left-turn accidents plus pedestrian and bicycle accidents.
- 196th Street SW at 40th Avenue West: 19 average accidents/year, 1.57 acc/MEV; safety issue appears to be congestion with predominantly rear-end and left-turn accidents plus pedestrian and bicycle accidents.
- 196th Street SW at 36th Avenue West: 35.5 average accidents/year, 2.36 acc/MEV; safety issue appears to be congestion with predominantly rear-end, left-turn and sideswipe accidents plus pedestrian and bicycle accidents.

Factors explaining why these intersections exhibit a higher accident rate were not evaluated, but 200th Street SW at 48th Avenue West experienced a high number of rear-end accidents with a modest amount of traffic through the intersection. The intersection of 200th Street SW at 46th Avenue West experienced a high number of rear-end and right-angle accidents. 196th Street SW at 48th Avenue West experienced a high number of left-turn, rear-end, and right-angle accidents; 196th Street SW at 44th Avenue West experienced a high number of rear-end, right-angle, and sideswipe accidents; 196th Street SW at 40th Avenue West experienced a high number of rear-end and left-turn accidents; and 196th Street SW at 36th Avenue West experienced a high number of rear-end and sideswipe accidents.

Pedestrian accidents occurred at 200th Street SW at 48th Avenue West (three), 196th Street SW at 48th Avenue West (two), 196th Street SW at 44th Avenue West (two), 196th Street SW at 40th Avenue West (one), and 196th Street SW at 36th Avenue West (one).

Bicycle accidents occurred at 200th Street SW at 50th Avenue West (one), 196th Street SW at 48th Avenue West (one), 196th Street SW at 44th Avenue West (one), 196th Street SW at 40th Avenue West (one), and 196th Street SW at 36th Avenue West (one).

5 LONG-TERM IMPACTS

Long-term impacts for the future forecast year of 2035 are discussed in this chapter for the light rail alternatives (including the Preferred Alternative) in comparison with the No Build Alternative. Appendix B lists improvements to the transportation system assumed to be in place under the No Build Alternative.

5.1 Regional Context and Travel Patterns

This chapter also discusses travel in the region and project corridor for a future year (forecast year 2035) and how the project is expected to affect that travel. Key observations and findings related to these travel projections include the following:

- The light rail alternatives, including the Preferred Alternative, would reduce overall regional VMT by approximately 300,000 miles per day and approximately 25,000 daily hours of travel.
- Screenline traffic volumes and v/c ratios would generally be reduced with the light rail alternatives.
- PM peak period person trips through the corridor would increase from 134,000 to 138,000 with the light rail alternatives.

5.1.1 Travel Demand and Patterns

Miles Driven and Hours Spent in Travel

Table 5-1 shows the VMT and VHT for the Puget Sound region for the No Build Alternative, the Preferred Alternative and other light rail alternative scenarios for forecast year 2035. By 2035, ridership on the light rail alternatives, including the Preferred Alternative, is estimated to help reduce automobile travel in the region by approximately 300,000 miles per day compared to the No Build Alternative (a reduction of approximately 0.3 percent), and about 25,000 fewer hours per day would be spent traveling by automobile (a reduction of approximately 0.8 percent). A significant portion of this reduction (more than 65 percent) is expected to occur within the project corridor as new riders shift from automobile to transit. The change in automobile travel would be very similar among the light rail alternatives; therefore, the differences among the alternatives were too small to be accurately modeled. Differences in transit ridership between light rail alternatives are discussed in Section 5.2, Transit.

Table 5-1. Daily Vehicle Miles of Travel and Vehicle Hours of Travel for Forecast Year 2035

Alternative	VMT		VHT	
	4-County Region	Project Corridor	4-County Region	Project Corridor
No Build Alternative	100,600,000	20,320,000	3,140,000	688,000
Preferred Alternative and Other Light Rail Alternatives	100,310,000 to 100,330,000	20,120,000 to 20,140,000	3,115,000 to 3,117,000	671,000 to 672,500

Vehicles Traveling through the Corridor

Tables 5-2 through 5-6 show AM peak hour, PM peak hour, daily traffic volumes, and peak hour v/c ratios at four selected screenline locations, respectively. The improved transit service provided by the Preferred Alternative and other light rail alternatives would attract more trips to transit, and hence slightly reduce vehicle volumes and congestion in the corridor. Screenline volumes are projected to be reduced by up to 5,400 vehicles per day. The v/c ratios indicate that southbound travel in the AM peak hour and northbound travel in the PM peak hour would be at capacity or over capacity in the corridor if the Lynnwood Link Extension was built or not, although these ratios would be slightly reduced with the light rail alternatives. This reflects, in part, the additional HOV lane capacity made available for other vehicles with the removal of applicable bus routes that currently operate in the I-5 HOV lanes.

Table 5-2. AM Peak Hour Screenline Vehicle Volumes for Forecast Year 2035

Screenline Location	No Build Alternative		Preferred Alternative and Other Light Rail Alternatives	
	Northbound	Southbound	Northbound	Southbound
1: North of Northgate Way NE	8,600	19,300	8,400	18,800
2: South of North 205th Street	7,300	14,800	7,200	14,400
3: South of 196th Street SW	6,500	11,100	6,400	10,900
4: NE 145th Street	Westbound	Eastbound	Westbound	Eastbound
	1,200	500	1,200	400

Table 5-3. AM Peak Hour Screenline Volume-to-Capacity Ratios for Forecast Year 2035

Screenline Location	No Build Alternative		Preferred Alternative and Other Light Rail Alternatives	
	Northbound	Southbound	Northbound	Southbound
1: North of Northgate Way NE	0.47	1.03	0.45	1.00
2: South of North 205th Street	0.44	0.98	0.43	0.95
3: South of 196th Street SW	0.55	0.95	0.54	0.94
4: NE 145th Street	Westbound	Eastbound	Westbound	Eastbound
	0.74	0.29	0.76	0.28

Table 5-4. PM Peak Hour Screenline Vehicle Volumes for Forecast Year 2035

Screenline Location	No Build Alternative		Preferred Alternative and Other Light Rail Alternatives	
	Northbound	Southbound	Northbound	Southbound
1: North of Northgate Way NE	21,000	13,300	20,500	13,100
2: South of North 205th Street	16,400	11,200	15,900	11,000
3: South of 196th Street SW	12,200	8,500	11,900	8,500
	Westbound	Eastbound	Westbound	Eastbound
4: NE 145th Street	1,000	1,100	1,000	1,000

Table 5-5. PM Peak Hour Screenline Volume-to-Capacity Ratios for Forecast Year 2035

Screenline Location	No Build Alternative		Preferred Alternative and Other Light Rail Alternatives	
	Northbound	Southbound	Northbound	Southbound
1: North of Northgate Way NE	1.13	0.71	1.09	0.70
2: South of North 205th Street	0.98	0.74	0.94	0.72
3: South of 196th Street SW	1.04	0.73	1.03	0.73
	Westbound	Eastbound	Westbound	Eastbound
4: NE 145th Street	0.60	0.65	0.59	0.63

Table 5-6. Daily Screenline Vehicle Volumes for Forecast Year 2035

Screenline Location	No Build Alternative		Preferred Alternative and Other Light Rail Alternatives	
	Northbound	Southbound	Northbound	Southbound
1: North of Northgate Way NE	218,600	217,400	213,200	212,600
2: South of North 205th Street	175,400	174,300	171,400	170,500
3: South of 196th Street SW	135,500	133,000	133,800	131,500
	Westbound	Eastbound	Westbound	Eastbound
4: NE 145th Street	16,200	13,800	16,300	13,800

People Traveling through the Corridor

Table 5-7 shows person throughput in the corridor at two screenline locations during the PM peak period for the No Build Alternative, the Preferred Alternative and other light rail alternatives for forecast year 2035. The person throughput includes trips on I-5, SR 99, and other north-south arterials, as well as transit trips on those facilities. Compared with the No Build Alternative, the Preferred Alternative and other light rail alternatives would result in more people moving through the corridor (person throughput) during the peak periods, as measured by screenlines across the corridor. The evening peak (northbound) direction would have the largest increase in total trips by all modes. The total person throughput in both directions would increase by approximately 3 percent north of Northgate Way and by 4 percent south of North

205th Street. On I-5 only, up to a 10 percent increase in person throughput is expected with the light rail alternatives.

Table 5-7. Person Throughput—Forecast Year 2035 PM Peak Period

Screenline Location	Alternative	Northbound	Southbound	Total
North of Northgate Way NE	No Build	86,000	48,000	134,000
	Preferred Alternative and Other Light Rail Alternatives	89,000	49,000	138,000
South of North 205th Street	No Build	66,000	39,000	105,000
	Preferred Alternative and Other Light Rail Alternatives	69,000	40,000	109,000

Sources: Sound Transit Ridership Model and PSRC Regional Model: WSDOT Project Version (2012)

5.2 Transit

This section discusses future transit service, operations, and expected ridership in the project corridor, and the project's potential effects on these elements. Key observations and findings include the following:

- By 2035, between 63,000 and 74,000 daily riders would use the proposed light rail extension, and overall transit usage from Snohomish County to King County would increase by as much as 55 percent under the light rail alternatives. Up to 22,000 new daily transit trips would be made using the regional system (bus and rail) as a result of the project.
- Transit travel times to and from all regional destinations would be shorter with the light rail alternatives, with AM peak trips from Lynnwood to Northgate and downtown Seattle 10 to 16 minutes faster than with the No Build Alternative.
- Transit passenger LOS between the project area and other regional destinations, including service frequency, hours of service, passenger load, and reliability, would improve significantly with the light rail alternatives.
- I-5 bus routes would be restructured to remove duplication of service with light rail, and local transit service could be restructured to reduce duplication and to provide improved or new connections to light rail under the light rail alternatives.

5.2.1 Regional Transit

The ridership forecast shows that by 2035, under current assumptions, all Community Transit bus service to Seattle would be terminated and replaced with light rail; between 63,000 and 74,000 riders would use the Lynnwood Link Extension each day, and up to 22,000 new daily transit trips throughout the region would result

from the extension. Overall regional transit use (on both bus and rail) would increase by up to approximately 50 percent. There would be direct light rail service from Lynnwood to Northgate, the University District, Capitol Hill, downtown Seattle, south of downtown Seattle, the Rainier Valley, and Sea-Tac Airport. Light rail connections would be provided to Bellevue, Bel-Red, and Overlake. In addition, light rail in the I-5 corridor would substantially improve transit service reliability. The reliability in service would improve the rating to LOS A with light rail, compared to LOS C or worse with the No Build Alternative. The frequency of transit throughout the day would also improve because light rail would operate with midday headways of 5 to 10 minutes, compared to midday headways of 15 minutes on the most frequent bus routes. Light rail would also be available for more hours of the day and additional destinations, such as Shoreline and Mountlake Terrace Transit Center.

Transit Facility and Service Characteristics

With the Preferred Alternative and other light rail alternatives, a number of transit facility improvements would be implemented, including new light rail stations and new or expanded park-and-ride and bus layover facilities at some of the stations. Proposed park-and-ride facilities are discussed in Sections 5.4.1 (Traffic Volume Forecasts) and 5.7 (Parking). Other bus facility improvements are identified in the *Definition of Alternatives Technical Memorandum* (Sound Transit 2012).

Regional bus service could be restructured to reduce duplication with light rail and to provide improved or new connections to the Lynnwood Link Extension. King County Metro, Community Transit, and Sound Transit Express have identified potential conceptual plans for bus services to be integrated with the future Link light rail routes and stations. This information included scenarios for low and high service levels, covering a range of potential future revenue scenarios. Table 5-8 lists the assumed level of feeder bus service serving the proposed light rail stations in terms of estimated number of peak hour buses serving each station. The low revenue scenarios were assumed for the ridership forecasting effort, while the higher revenue scenarios were used to conservatively establish the size of the bus facilities at each station. However, actual changes to regional and local bus routes will require a public comment process and council or board approval to implement changes. This section describes some conceptual options for modifying regional bus operations. Additional information on the conceptual bus options is provided in the *Definition of Alternatives Technical Memorandum* (Sound Transit 2012) and the *Ridership Forecasting Technical Report* (Sound Transit 2012).

Table 5-8. Assumed Feeder Bus Service to Light Rail Stations

Station (Number of Feeder Routes)	Peak Bus Trips per Hour		Midday Bus Trips per Hour	
	Low Revenue Scenario	High Revenue Scenario	Low Revenue Scenario	High Revenue Scenario
NE 130th Street (3 routes)	18	18	12	12
NE 145th Street (4 routes) ^a	16	16	14	14
NE 155th Street (2 routes)	6	6	6	6
NE 185th Street (4 routes, including Community Transit <i>Swift</i>)	18	18	16	16
Mountlake Terrace (6 routes)	17	21	14	15
220th Street SW (2 routes)	2	8	1	5
Lynnwood Transit Center (16 routes)	49	62	23	28

^a Some routes at this station would serve NE 130th Street instead if there were a station at NE 130th Street.

Ridership

Table 5-9 shows daily ridership on buses (for the 2011 base year and No Build Alternative for 2035) and on light rail (for five representative light rail scenarios in 2035) in the project corridor. The number of light rail project riders in any of the representative light rail scenarios would be more than double the bus riders in the No Build Alternative. Among the light rail scenarios, project riders would range from 63,000 to 74,000 daily riders. The total daily systemwide boardings for the No Build and light rail alternatives are also provided in Table 5-9. This number is calculated differently than the project rider, and includes all bus and rail transit boardings in the system.

Table 5-9. Daily Ridership for Forecast Year 2035

	Bus Riders		Light Rail Project Riders					
	Base Year (2011)	No Build Alternative	Light Rail Alternatives					
			4 ^a	4	5	5	5	6
Number of Stations								
Station Locations			North 145th Street North 185th Street Mountlake Terrace Transit Center Lynnwood Transit Center	North 145th Street North 185th Street Mountlake Terrace Transit Center Freeway Station Lynnwood Transit Center	North 130th Street North 145th Street North 185th Street Mountlake Terrace Transit Center Lynnwood Transit Center	North 130th Street North 155th Street North 185th Street Mountlake Terrace Transit Center Lynnwood Transit Center	North 145th Street North 185th Street Mountlake Terrace Transit Center 220th Street SW Lynnwood Transit Center	North 130th Street North 145th Street North 185th Street Mountlake Terrace Transit Center 220th Street SW Lynnwood Transit Center
Daily Project Corridor Light Rail Project Riders^b	--	--	64,000-72,000	63,000-71,000	66,000-74,000	66,000-74,000	64,000 - 72,000	66,000-74,000
Daily Project Corridor I-5 Bus Riders	19,400	32,000-34,000	--	--	--	--	--	--
Total Systemwide Daily Transit Trips	384,000	601,000	623,000	622,000	622,000	622,000	623,000	622,000
Daily New Transit Riders	--	--	21,500	20,800	20,900	20,800	21,200	20,700
Daily Passenger Miles	3,171,000	5,607,000	5,966,000	5,955,000	5,951,000	5,950,000	5,957,000	5,942,000
Daily Systemwide Light Rail Boardings	25,400	249,000	283,000	283,000	283,000	283,000	283,000	283,000
Total Systemwide Daily Boardings	533,000	915,000	943,000	942,000	940,000	940,000	941,000	938,000

Source: Sound Transit Ridership Forecasting Model

^a Preferred Alternative^b FTA defines project riders as the number of trips on any portion of the project within a given weekday; the range represents assumptions on future population and employment forecasts for station areas.

Average weekday boardings by station under different alternative station combinations were estimated for 2035. An example of how weekday boardings are calculated is shown in Figure 5-1. Figures 5-2a and 5-2b show station boardings for the Preferred Alternative and for other potential station combinations. The ridership for the Lynnwood Transit Center station would vary depending on the combination of stations to the south. For example, as shown in Figures 5-2a and 5-2b, with a station at the Mountlake Terrace Transit Center, and no station at 220th Street SW or NE 130th Street, there would be 17,900 daily boardings at the Lynnwood Transit Center Station. However, as also shown in Figures 5-2a and 5-2b, the addition of a station at NE 130th Street to this scenario would reduce ridership at the Lynnwood Transit Center Station to 17,600 boardings. The number of boardings shown in Figures 5-2a/5-2b through 5-5 is not directly comparable to the project riders shown in Table 5-9 because these numbers are calculated differently. The number of project riders is calculated as the number of inbound boardings and outbound alightings that occur within the project corridor (north of Northgate). For trips where a rider boards and alights within the project corridor, only one of these is counted in the project rider calculation. In contrast, the station boardings shown in Figures 5-2a/5-2b through 5-5 include only boardings. To generate a number that is roughly comparable to the project riders shown in Table 5-9, one would need to double the numbers shown in Figures 5-2a/5-2b through 5-5.

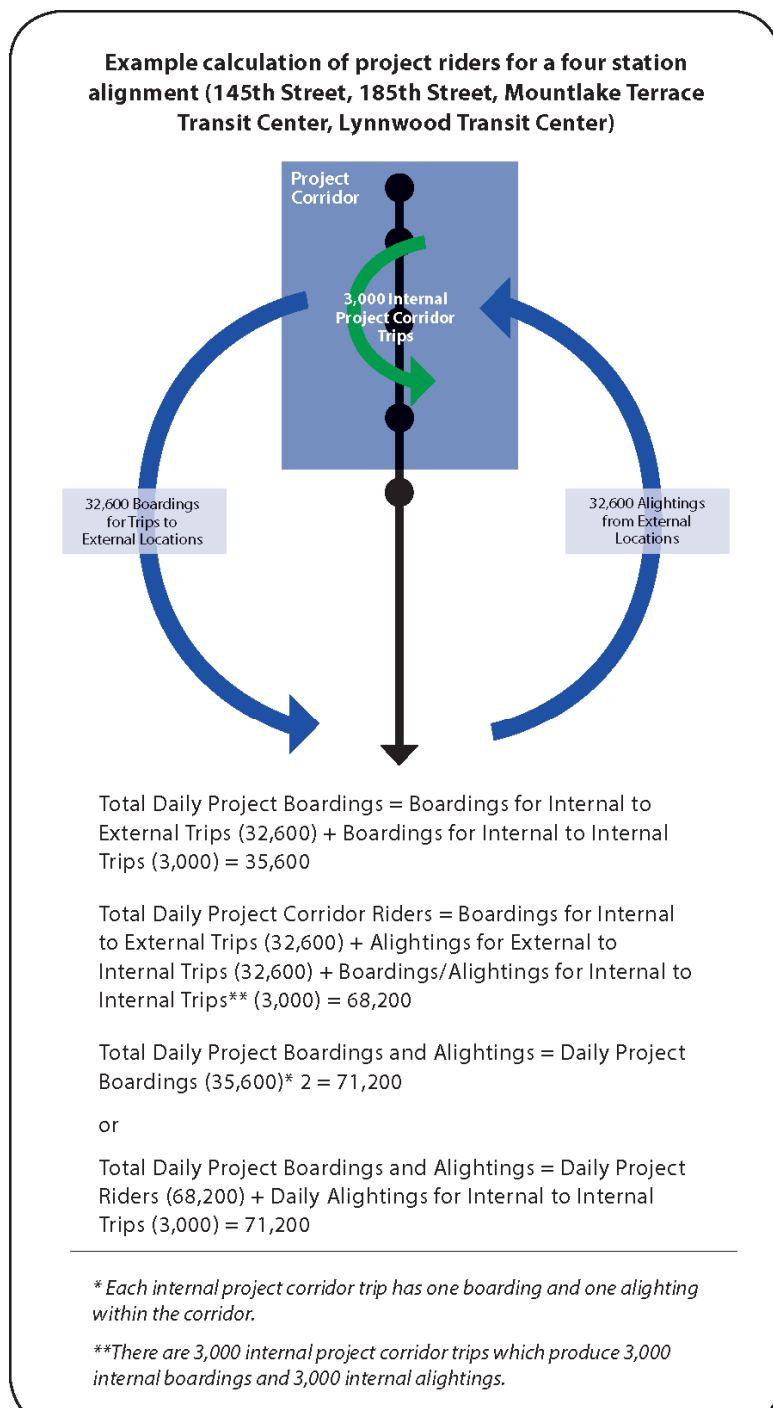


Figure 5-1. Example Calculation of Project Riders

However, this would be slightly higher than the number of project riders, because it would reflect all boardings and alightings for those trips that occur at stations completely within the project corridor. Figures 5-3 through 5-5 show boardings for combinations of stations along the project corridor and indicate where boardings are gained and lost, depending on how ridership is attracted to a combination of stations. Some key trade-offs include the following:

- Adding the 220th Street SW and NE 130th Street Stations to the Preferred Alternative is projected to reduce daily boardings at the Lynnwood Transit Center Station by 700. Part of the reason for the net loss at the Lynnwood Transit Center, compared to a project without these two optional stations, is that adding the two optional stations would increase travel time for the light rail trip, which would be less attractive for riders traveling to and from Lynnwood. In addition, approximately 200 of the forecasted daily boardings would shift from the Lynnwood Transit Center to the new 220th Street SW Station.
- Moving the Mountlake Terrace Station from the transit center into the freeway median would reduce daily boardings by 800 at the station and for the corridor because it would add substantial walk time for riders using the Mountlake Terrace Station.
- Adding NE 130th Street as a third Segment A station would result in a net increase of 500 daily boardings because it would provide additional access to the transit network. Approximately 1,200 of the daily boardings at the NE 130th Street Station would shift from the Northgate Station.
- For the alternatives with three stations in Segment A, moving the station from NE 145th Street to NE 155th Street would reduce daily boardings by approximately 400 for the segment.

The difference in boardings among alternatives is influenced by a combination of factors, including the density of population and employment near stations, the amount of parking available at stations, connecting local bus service at stations, additional travel time caused by additional stations elsewhere in the corridor, and distance between stations. Figures 5-3 through 5-9 show the 15-minute walkshed for each of the potential station locations, while Table 5-10 shows the forecasted population and employment in 2035 that is contained within those walksheds.

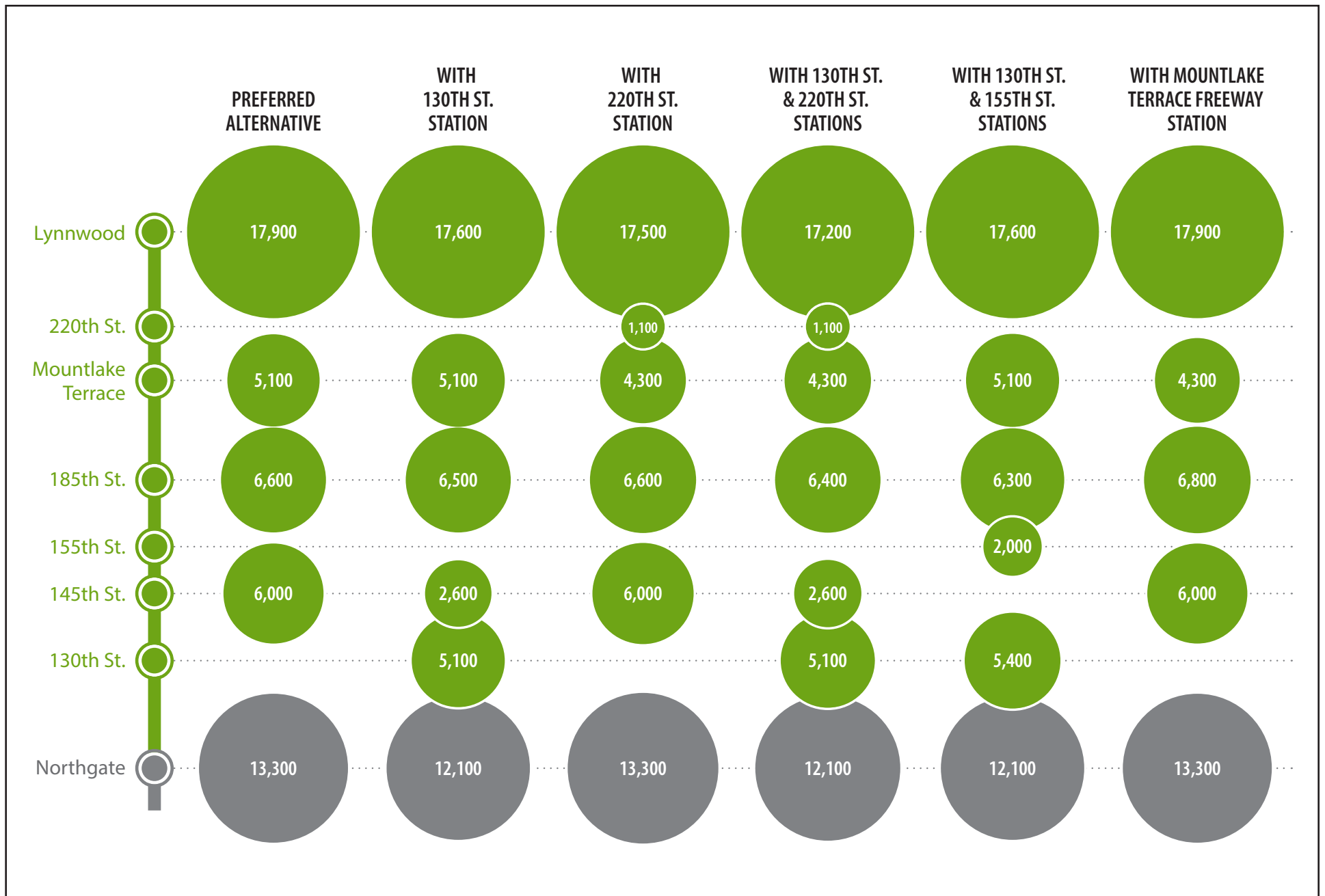


Figure 5-2
2035 Average Weekday Station Boardings
for the Preferred Alternative and Options

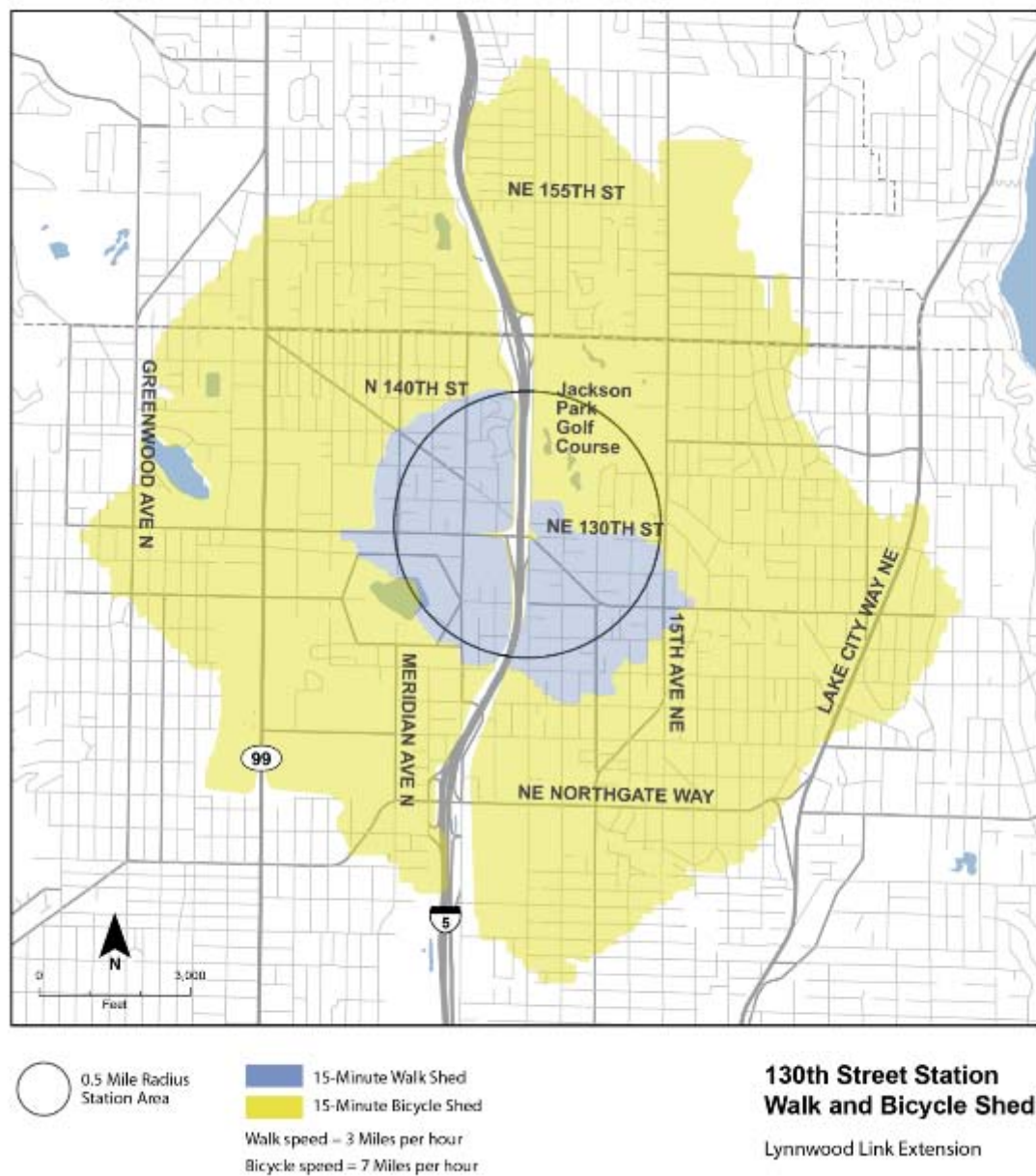


Figure 5-3. 15-minute Walkshed and Bicycleshed—NE 130th Street Station

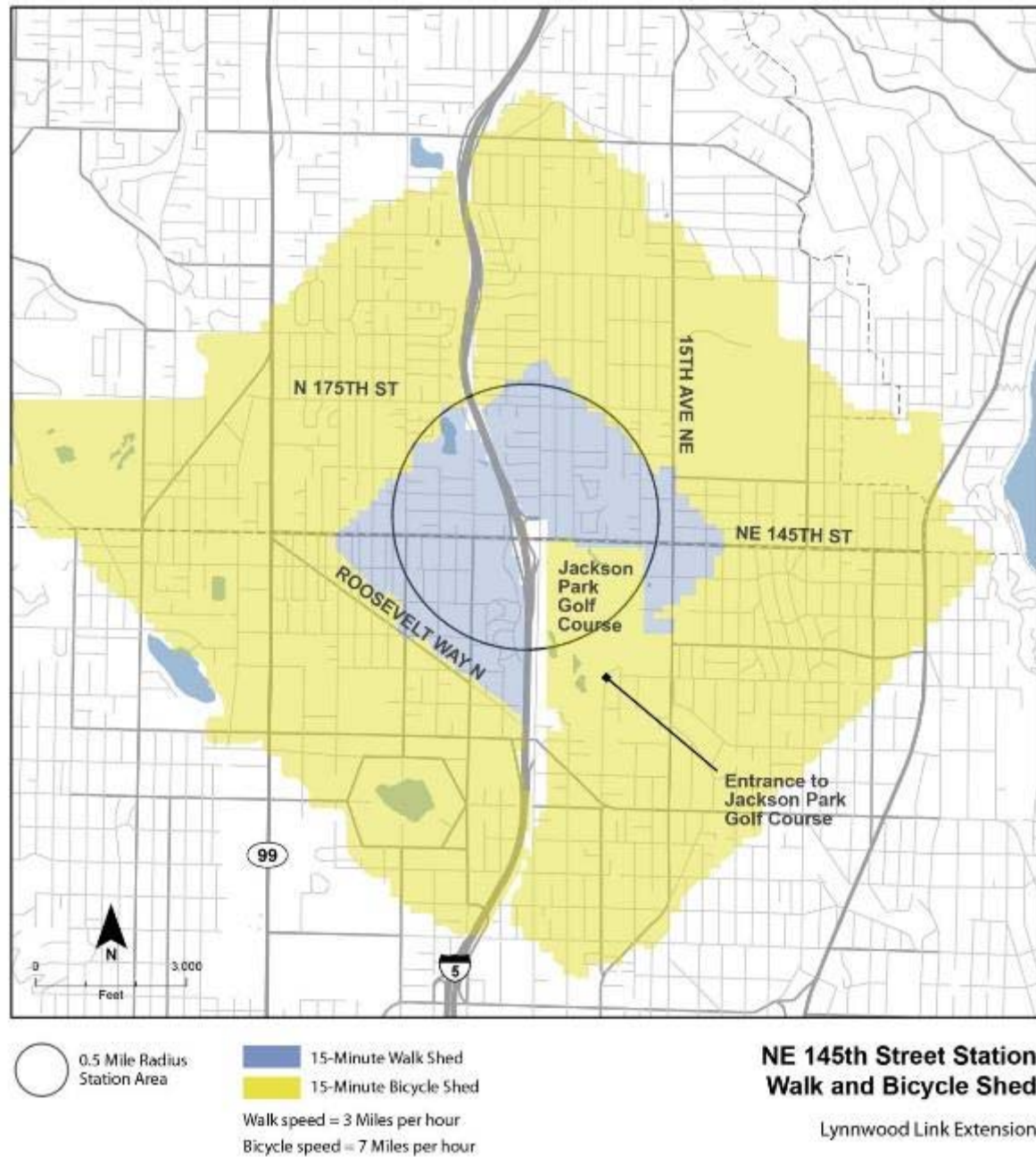


Figure 5-4. 15-minute Walkshed and Bicycleshed—NE 145th Street Station

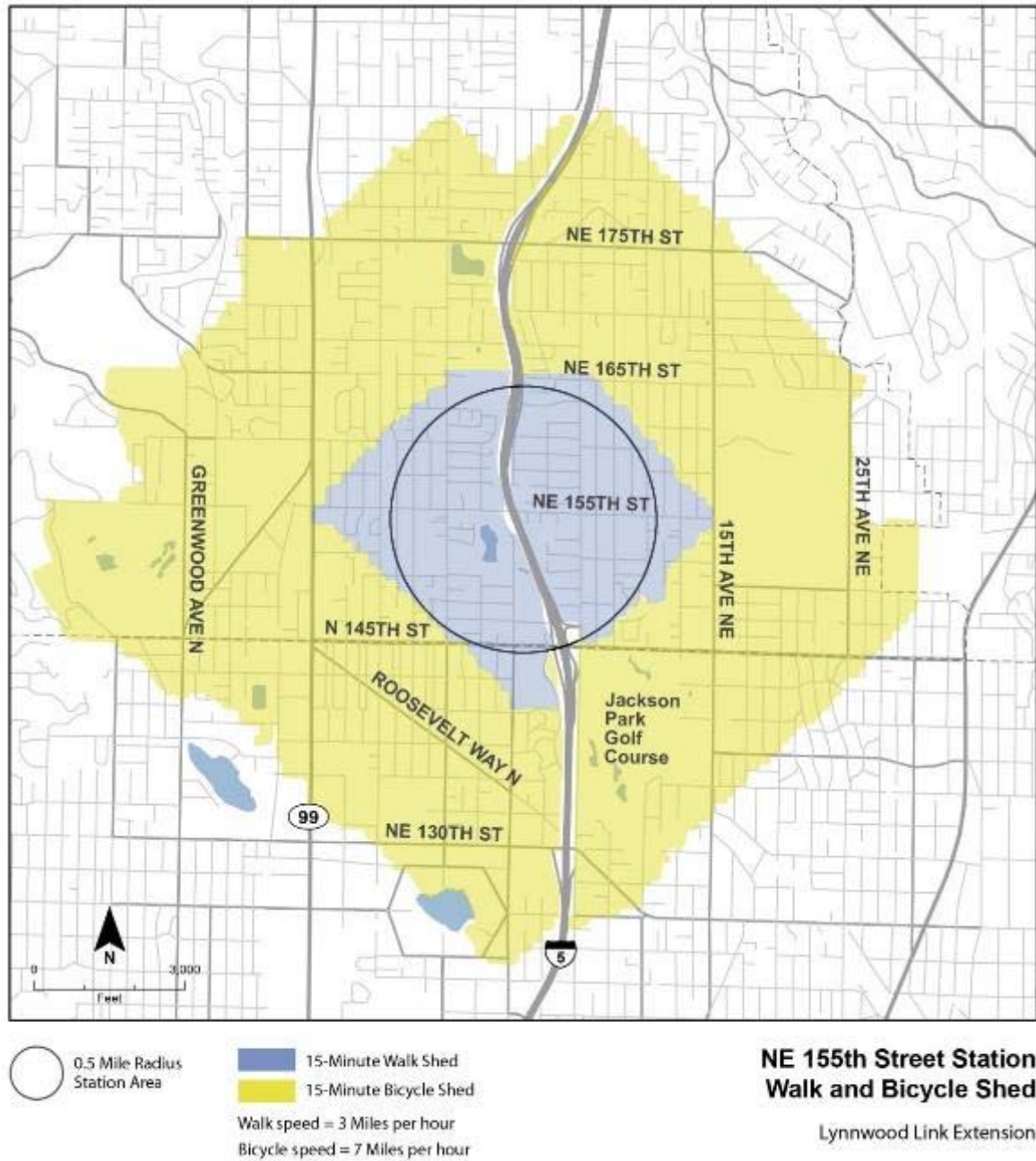


Figure 5-5. 15-minute Walkshed and Bicycleshed—NE 155th Street Station

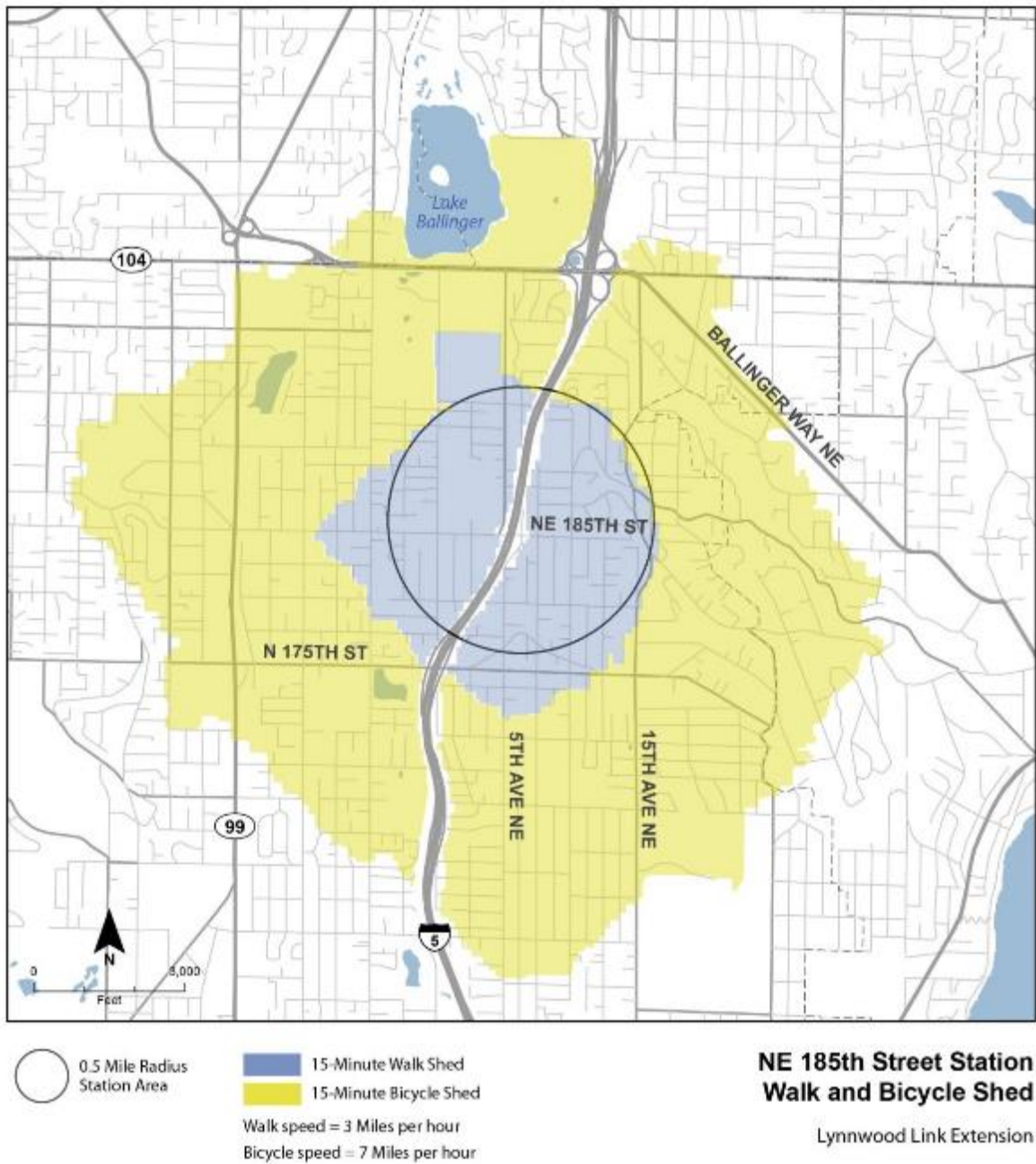
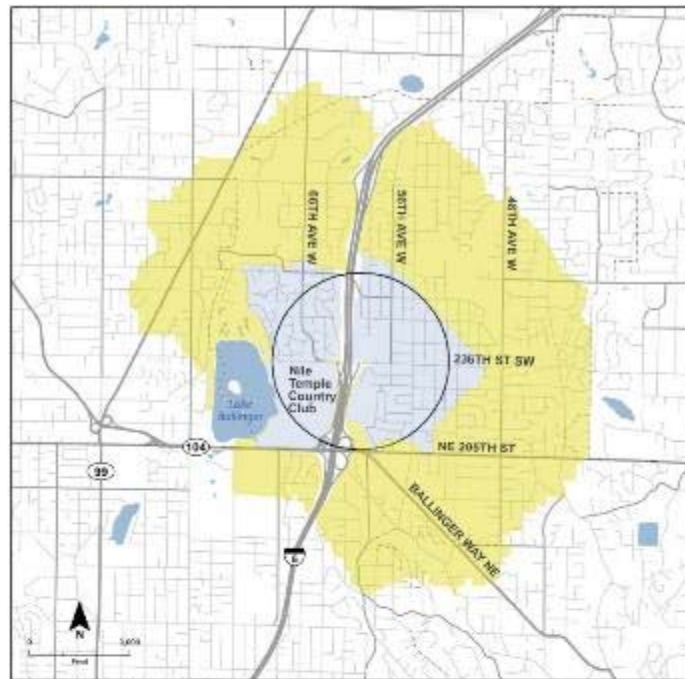
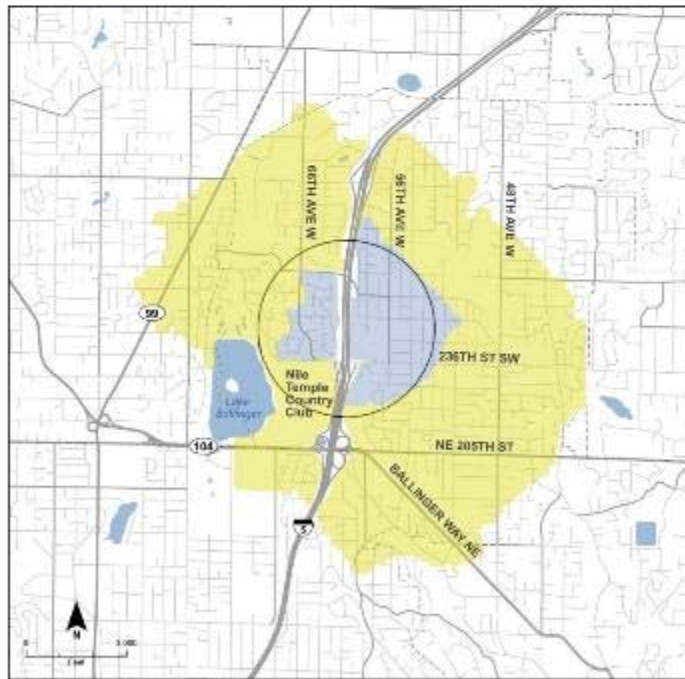


Figure 5-6. 15-minute Walkshed and Bicycleshed—NE 185th Street Station



Mountlake Terrace Transit Center Station



Mountlake Terrace Freeway Station



Figure 5-7. 15-minute Walkshed and Bicycleshed—Mountlake Terrace Transit Center and Mountlake Terrace Freeway Station

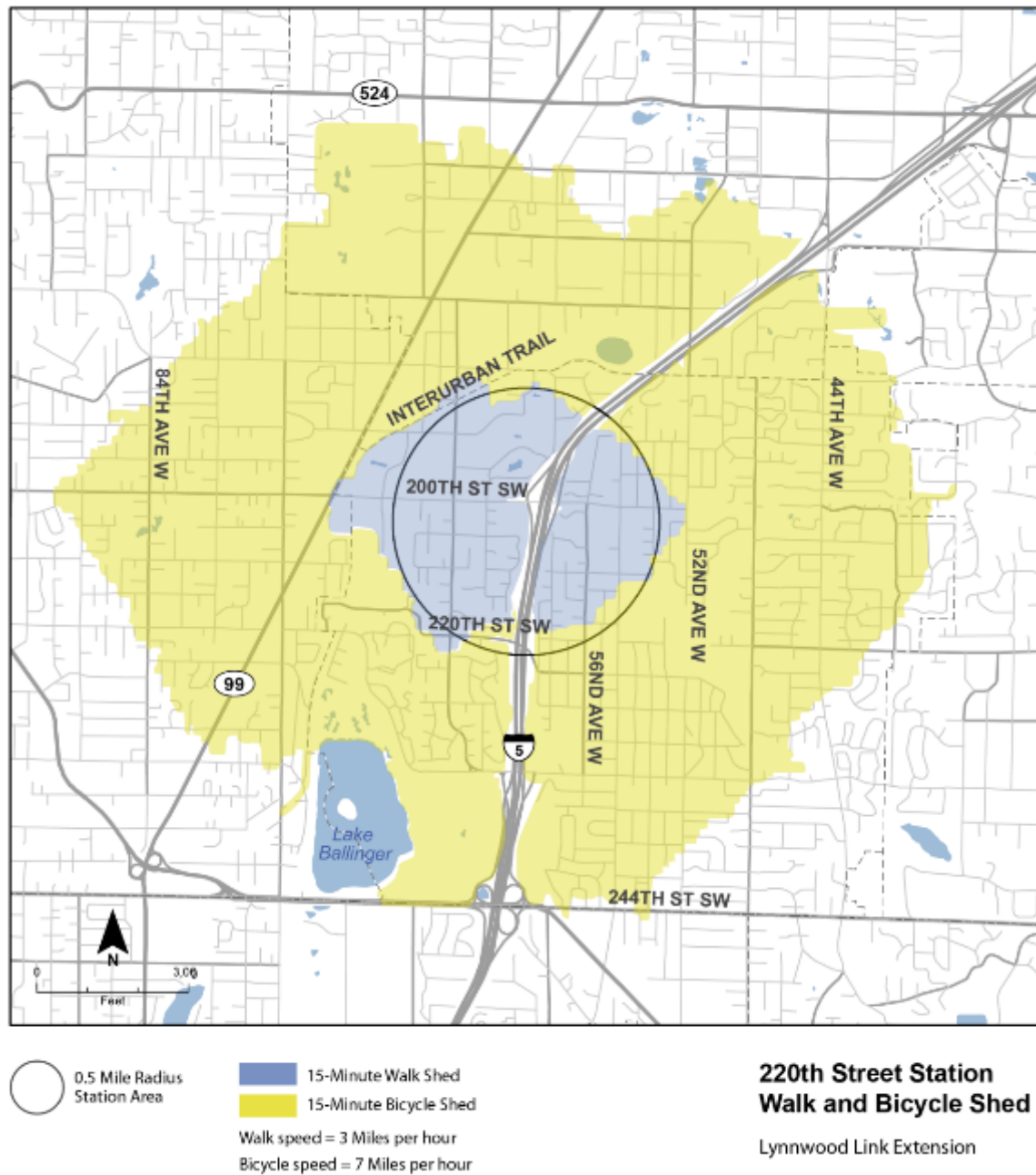


Figure 5-8. 15-minute Walkshed and Bicycleshed—220th Street SW Station

Figure 5-9. 15-minute Walkshed and Bicycleshed—Lynnwood Transit Center Station Alternatives

Table 5-10. Walkshed and Bicycledshed Population and Employment for Forecast Year 2035

Station	Walkshed		Bicycledshed	
	2035 Population	2035 Employment	2035 Population	2035 Employment
NE 130th Street Station	5,000	900	53,100	23,700
NE 145th Street Station	7,800	1,400	42,800	12,900
NE 155th Street Station	8,300	1,300	32,200	13,500
NE 185th Street Station	7,400	2,200	33,800	9,900
Mountlake Terrace Transit Center Station	4,700	1,100	24,700	10,000
Mountlake Terrace Freeway Station	4,100	,100	21,000	9,100
220th Street SW Station	3,200	2,300	32,800	16,600
Lynnwood Park-and- Ride Station	6,000	7,600	45,200	38,200
Lynnwood Transit Center Station	6,100	7,100	42,800	42,800
200th Street SW Station	7,800	8,500	49,700	47,400

Source: PSRC Land Use Forecast, 2013 Land Use Baseline, Maintenance Release 1 (MR1) Update

Transit Travel Times

Tables 5-11 and 5-12 show estimated AM peak-period transit travel times from Shoreline (I-5 and NE 145th Street) and Lynnwood (Lynnwood Transit Center), respectively, to regional destinations for the No Build Alternative, the Preferred Alternative and other light rail alternatives in forecast year 2035. Travel times are shown for light rail scenarios with four, five, and six stations, respectively. Bus travel times are based on existing scheduled travel times, adjusted to reflect estimated future roadway congestion, while light rail travel times are based on estimated future actual travel times. Travel times under the No Build Alternative are expected to increase compared with existing conditions because bus speeds in general purpose and HOV freeway lanes would degrade with increasing traffic congestion. Travel times to all regional destinations would be shorter with the Preferred Alternative and other light rail alternatives, with trips to Northgate from Lynnwood up to 12 minutes faster and trips to downtown Seattle from Lynnwood up to 16 minutes faster than the No Build Alternative, which relies on bus travel in congested mixed traffic for portions of its route.

Table 5-11. 2035 Transit Travel Times (minutes) from Shoreline for AM Peak Period Southbound

Destination	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives	
		4 Stations	5/6 Stations
Northgate	10	3	4
University of Washington	22	11	12
Capitol Hill	26	14	15
Downtown Seattle	22	16	17
Sea-Tac Airport	63	51	52
Downtown Bellevue	53	41	42
Overlake	63	51	52

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

Table 5-12. 2035 Transit Travel Times (minutes) from Lynnwood for AM Peak Period Southbound

Destination	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives		
		4 Stations	5 Stations	6 Stations
Northgate	26	14	15	16
University of Washington	38	22	23	24
Capitol Hill	42	25	26	27
Downtown Seattle	43	27	28	29
Sea-Tac Airport	79	62	63	64
Downtown Bellevue	55	52	53	54
Overlake	79	62	63	64

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

Transit travel times during the PM peak period from regional destinations to Shoreline and Lynnwood, respectively, are presented in Tables 5-13 and 5-14. Similar to AM peak southbound trips, travel times from all regional destinations would be shorter with the Preferred Alternative and other light rail alternatives, with trips from Northgate to Lynnwood up to 10 minutes faster and trips from downtown Seattle to Lynnwood up to 15 minutes faster than the No Build Alternative.

Table 5-13. 2035 Transit Travel Times (minutes) to Shoreline for PM Peak Period Northbound

Origin	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives	
		4 Stations	5/6 Stations
Northgate	10	3	4
University of Washington	22	11	12
Capitol Hill	26	14	15
Downtown Seattle	26	16	17
Sea-Tac Airport	63	51	52
Downtown Bellevue	53	41	42
Overlake	63	51	52

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

Table 5-14. 2035 Transit Travel Times (minutes) to Lynnwood for PM Peak Period Northbound

Origin	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives		
		4 Stations	5 Stations	6 Stations
Northgate	24	14	15	16
University of Washington	36	22	23	24
Capitol Hill	40	25	26	27
Downtown Seattle	42	27	28	29
Sea-Tac Airport	77	62	63	64
Downtown Bellevue	64	52	53	54
Overlake	77	62	63	64

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

The southbound bus travel times during the PM peak period to regional destinations from Shoreline and Lynnwood, respectively, are presented in Tables 5-15 and 5-16. Similar to AM peak southbound trips and PM peak northbound trips, travel times to all regional destinations would be shorter with the Preferred Alternative and other light rail alternatives, with trips to Northgate from Lynnwood up to 6 minutes faster and trips to downtown Seattle from Lynnwood up to 11 minutes faster than the No Build Alternative.

Table 5-15. 2035 Transit Travel Times (minutes) from Shoreline for PM Peak Period Southbound

Destination	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives	
		4 Stations	5/6 Stations
Northgate	14	3	4
University of Washington	26	11	12
Capitol Hill	30	14	15
Downtown Seattle	28	16	17
Sea-Tac Airport	67	51	52
Downtown Bellevue	57	41	42
Overlake	67	51	52

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

Table 5-16. 2035 Transit Travel Times (minutes) from Lynnwood for PM Peak Period Southbound

Destination	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives		
		4 Stations	5 Stations	6 Stations
Northgate	20	14	15	16
University of Washington	32	22	23	24
Capitol Hill	36	25	26	27
Downtown Seattle	38	27	28	29
Sea-Tac Airport	73	62	63	64
Downtown Bellevue	55	52	53	54
Overlake	73	62	63	64

Sources: No Build Alternative: King County Metro Trip Planner, <http://metro.kingcounty.gov/>, representative trip selected and adjusted for future estimated roadway congestion. Light rail alternatives: Sound Transit light rail travel time estimates

The No Build Alternative transit travel times (forecast year 2035) shown above reflect the planned light rail network extending to Northgate to the north and Overlake to the east. For many of the trips depicted above, passengers would use bus service to travel between Lynnwood/Shoreline and Northgate, and light rail between Northgate and other regional destinations. These bus routes would travel in mixed traffic under varying degrees of congestion, hence adding delays to the trip. These times also incorporate transfer times between bus routes if more than one route is needed to complete the trip, as well as between bus and rail.

In addition to these travel times, as listed in Tables 5-11 through 5-16, the total transit travel time would also include the time to access the bus as a pedestrian, bicyclist, passenger, or driver. The wait time for a bus would be dependent on the service reliability (adherence to schedule). If the scheduled bus arrival time is unreliable, then the riders must arrive prior to the scheduled time and wait until the bus arrives either on time or late, adding to the total travel time. Bus reliability is an

LOS factor discussed in a subsequent section. An analysis of transfer requirements for transit users is discussed below.

Transfers

When transit riders need to transfer to complete a trip, they may see the transit system as being too complex and their travel times can feel longer or more unpredictable. As a result, some may choose not to use transit for the trip. However, the quality of transfers, whether between buses or between bus and rail, has a dramatic impact on the overall perception of transfers. Factors determining the quality of transfers include proximity of transfer location, wait time, waiting area conditions, service reliability, safety and security, and availability of real-time arrival information.

Wait time is a function of the service frequency on the route to which a transit user is transferring and/or the ability to provide reliable “timed transfer” connections. There is evidence that quality transfers are acceptable and can be only a minor impediment. For example, King County Metro, which historically has been one of the strongest advocates of the “one-seat ride,” has been implementing a new “multi-centered” route structure focused on a series of transit “hubs” where convenient transfers can be made to multiple destinations. The key to the acceptance and success of these systems is safe, appealing, and protected transfer facilities together with more frequent service and/or timed transfers, thereby resulting in negligible impacts on ridership.

Transfers can be measured by a systemwide transfer rate, which is the average number of transit boardings per transit trip. Table 5-17 provides the system-wide transfer rate for the existing base year (2011) as well as the projected transfer rate for the forecast year (2035) under the No Build Alternative and for the light rail alternatives. Overall, the transfer rate is estimated to increase from the base year (1.39) to the No Build Alternative (1.52). This can be attributed to an increase in riders transferring from local bus service to the planned light rail extensions to Northgate and Overlake. Overall, future system-wide transfer rates with the Preferred Alternative and other light rail alternatives would be lower than the No Build Alternative. The slight reduction in transfer rate is predicted with the Preferred Alternative and other light rail alternatives because riders using the Lynnwood Link Extension would have a no-transfer, one-seat ride to regional destinations accessible via the light rail network. Transfers may be required to travel to destinations to the east, including downtown Bellevue and Overlake. Also, transfers in some parts of the regional system could increase as more riders use light rail for a part of their trip because it could reduce their overall travel times.

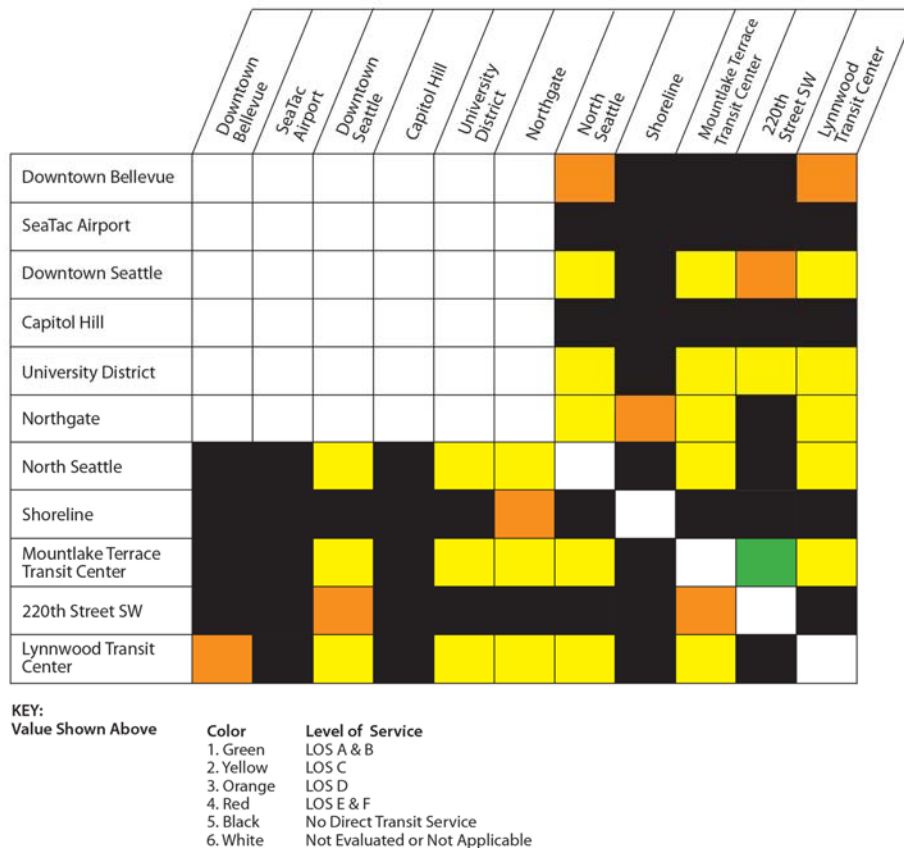
Table 5-17. Transit Transfer Rates for the Base Year (2011) and Forecast Year (2035)

	Base Year	No Build Alternative	Preferred Alternative and Other Light Rail Alternatives
Transfer Rate	1.39	1.52	1.51
Total Daily (24 hours) Transit Trips	384,000	601,000	622,000 to 623,000
Total Daily Transit Boardings	533,000	915,000	938,000 to 943,000

Source: Sound Transit Ridership Forecasting Model

Level of Service for Service Frequency

Figures 5-10 and 5-11 show the LOS for service frequency for the No Build Alternative and light rail alternatives (including the Preferred Alternative) in forecast year 2035, respectively. As shown in Figure 5-10, the light rail connections created by implementing the Northgate Link Extension and East Link projects for travel connecting downtown Seattle, Capitol Hill, the University District, Northgate, downtown Bellevue, and Sea-Tac Airport were not evaluated. For the majority of those origin-destination pairs with no-transfer, one seat service under the No Build Alternative, the LOS for service frequency is expected to be LOS C.

Figure 4-17**Figure 5-10. No Build Alternative LOS for Service Frequency in Forecast Year 2035**

As shown in Figure 5-11, the implementation of the Lynnwood Link Extension (forecast year 2035) improves the quality of service to LOS A for connections between north Seattle, Shoreline, Mountlake Terrace Transit Center, 220th Avenue SW, Lynnwood Transit Center and the rest of the Link light rail system.

	Downtown Bellevue	SeaTac Airport	Downtown Seattle	Capitol Hill	University District	Northgate	North Seattle	Shoreline	Mountlake Terrace Transit Center	220th Street SW	Lynnwood Transit Center
Downtown Bellevue											
SeaTac Airport											
Downtown Seattle											
Capitol Hill											
University District											
Northgate											
North Seattle											
Shoreline											
Mountlake Terrace Transit Center											
220th Street SW											
Lynnwood Transit Center											

KEY:

Value Shown Above

Color

1. Green
2. Yellow
3. Orange
4. Red
5. Black
6. White

Level of Service

- LOS A & B
- LOS C
- LOS D
- LOS E & F
- No Direct Transit Service
- Not Evaluated or Not Applicable

Figure 5-11. Preferred Alternative and Other Light Rail Alternatives LOS for Service Frequency in Forecast Year 2035

Level of Service for Hours of Service

Figures 5-12 and 5-13 show the LOS for hours of service for the No Build Alternative, the Preferred Alternative and other light rail alternatives in forecast year 2035, respectively. As shown in Figure 5-12, the light rail connections created by implementing the Northgate Link Extension and East Link projects for travel connecting downtown Seattle, Capitol Hill, the University District, Northgate, downtown Bellevue, and Sea-Tac Airport were not evaluated.

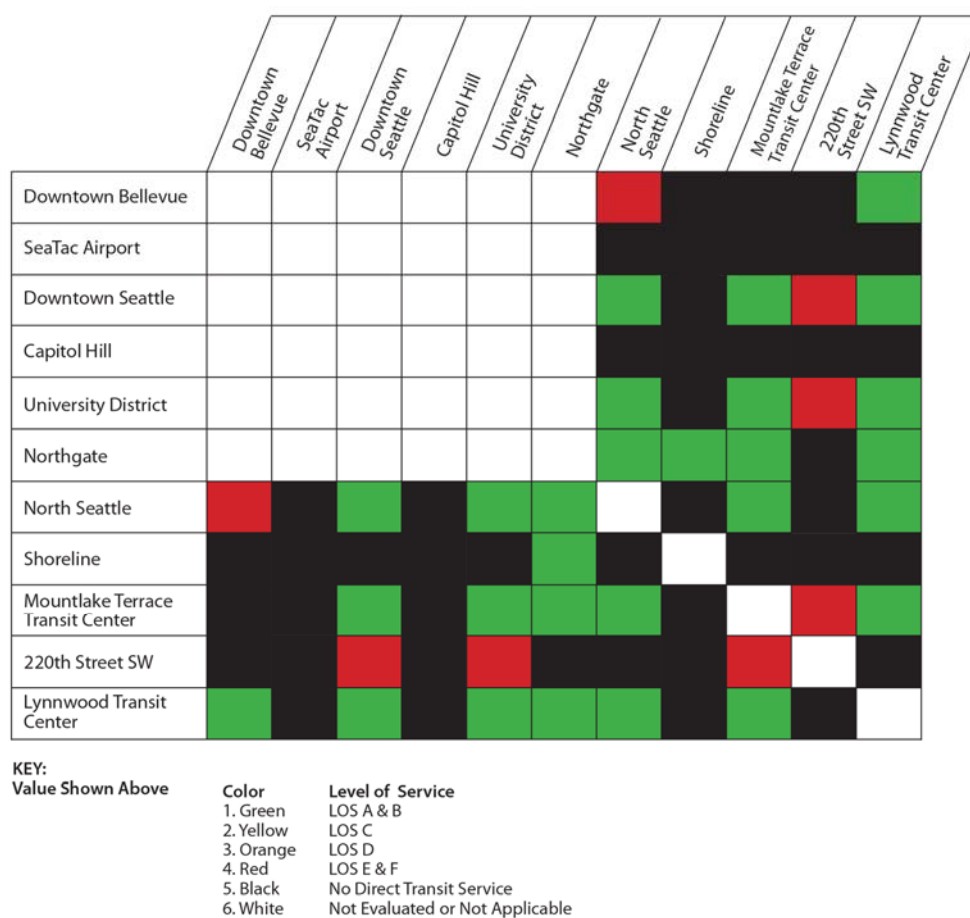


Figure 5-12. No Build Alternative LOS for Hours of Service in Forecast Year

As shown in Figure 5-13, implementing the Lynnwood Link Extension (all alternatives including the Preferred Alternative) improves the hours of service to LOS A for no-transfer, one-seat service between, in particular, Shoreline, 220th Street SW, and the rest of the Link light rail system.

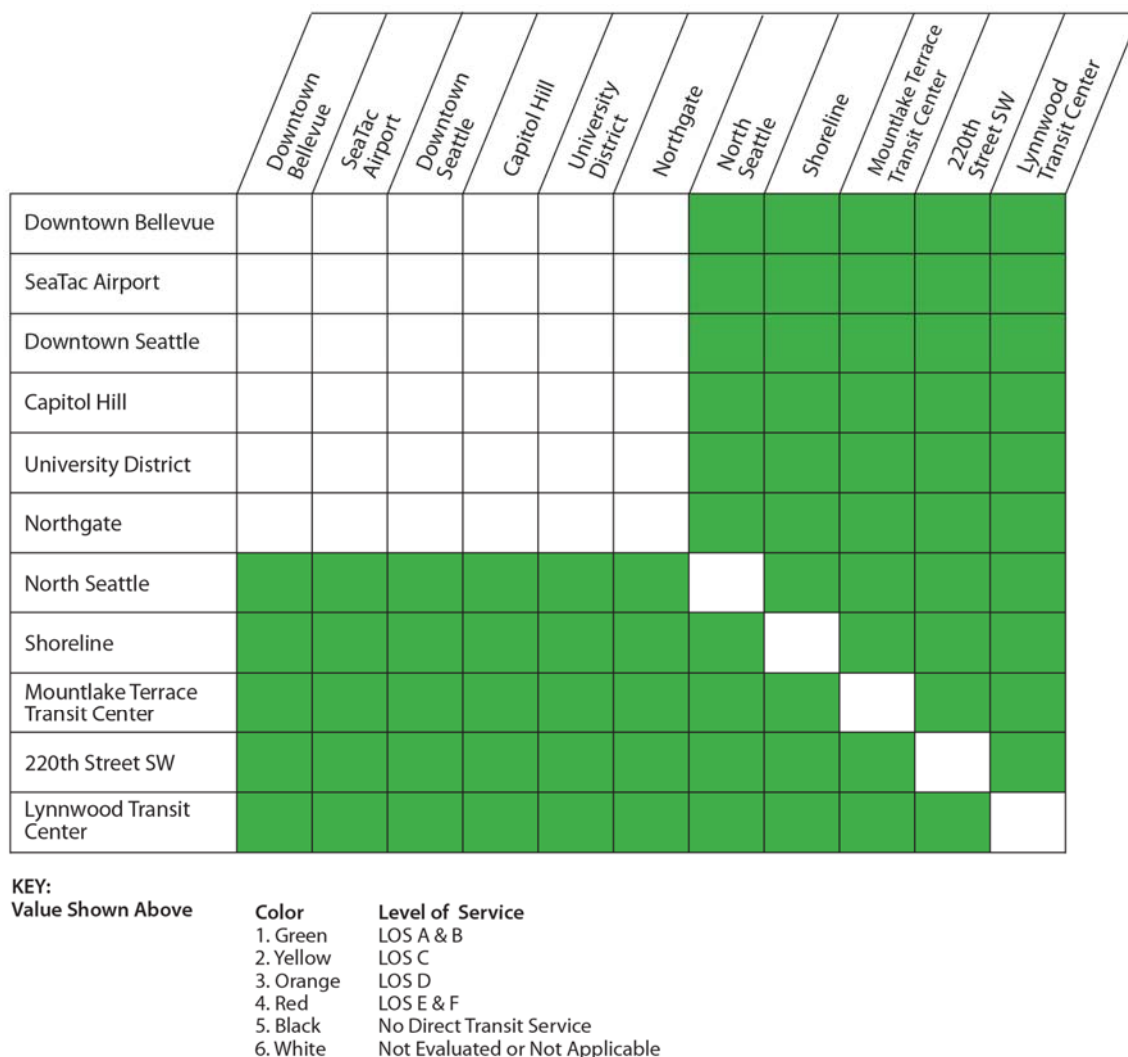


Figure 5-13. Preferred Alternative and Other Light Rail Alternatives LOS for Hours of Service in Forecast Year 2035

Level of Service for Passenger Load

Passenger load LOS for the No Build Alternative, the Preferred Alternative and other light rail alternatives (forecast year 2035) were estimated using passenger volume forecasts from the Sound Transit Ridership Model, and calculated in accordance with the TCQSM guidelines¹⁶. Table 5-18 shows the PM peak-hour passenger load LOS on bus routes and light rail in the corridor at three locations for the No Build Alternative and light rail alternatives (forecast year 2035). With the No Build Alternative, the passenger load LOS for bus service on I-5 is expected to be between LOS D and F. For the light rail alternatives, bus service on parallel north-

¹⁶ Methodology defined in the second edition of the TCQSM (2003) was used for consistency with the DEIS.

south facilities would be LOS A, while light rail LOS would be LOS A for all locations and directions shown, except for the northbound direction north of Northgate, where passenger loads would reach LOS C.

Table 5-18. PM Peak Hour Passenger Load Factors in Forecast Year 2035

Screenline Location	Direction	No Build Alternative	Light Rail Alternatives	
		Bus LOS	Bus LOS	Light Rail LOS
Screenline 1: North of NE Northgate Way	Northbound	D	A	C
	Southbound	F	A	A
Screenline 2: South of 205th Street	Northbound	E	A	A
	Southbound	F	A	A
Screenline 3: North of 112th Street SW	Northbound	D	A	A
	Southbound	F	A	A

Source: Sound Transit Ridership Model, 2014

Level of Service for Reliability and On-time Performance

Reliability of bus service in forecast year 2035 for the No Build Alternative is expected to degrade in comparison with existing conditions as traffic congestion on freeways and arterials in the project corridor continues to worsen. Forecasts show future speeds will decrease along I-5 as congestion increases. Poor bus reliability could result in buses arriving close together (bunched) rather than at scheduled intervals, as well as buses being unable to meet scheduled arrival times. Light rail operating within the corridor would be more reliable because it would operate in an exclusive right-of-way for the entire length of the corridor. However, light rail reliability in the corridor could be subject to delays experienced elsewhere in the system where the light rail segment is operating at-grade.

5.2.2 Local and Sub-Regional Bus Transit

As discussed in Section 5.4.2, congested traffic operations that would occur with the No Build Alternative, or could occur with the light rail alternatives, may affect the reliability of local bus service near stations. Near the proposed Lynnwood Station area, congested traffic operations along 196th Street SW without the light rail project would similarly affect local bus service and the access provided to the station.

Bus routes on I-5 would be restructured to remove duplication of service with light rail. Local transit service could be restructured to reduce duplication and to provide improved or new connections to the Lynnwood Link Extension. Additional routes would achieve desirable goals for frequency and coverage by establishing local service to the light rail stations, but new routes would require additional resources. Local route changes will require a public comment process and council or board approval to implement the changes. The following sections describe assumed bus

operations at stations (based on input from local transit operators) and some conceptual options for modifying local bus operations. Additional information on the conceptual bus options is provided in Section 5.2.1. Section 5.5.1 discusses the pedestrian flow analysis associated with movement to and from bus stops to the light rail stations.

Segment A: Seattle to Shoreline

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station

Local routes that serve the North Jackson Park Park-and-Ride lot would be combined with local service parallel to the light rail corridor to provide a more frequent service to the NE 145th Street Station. Local bus riders taking a short trip who are currently on routes parallel to the proposed light rail alignment could experience reduced frequency of service if new routes are not added. Riders who are on local bus routes and taking a longer trip could benefit by frequent service and a transfer to light rail. Routes selected for rerouting to the light rail stations could be those that currently carry more long-distance riders. King County Metro's conceptual service plan focuses east-west bus service on NE 155th Street to avoid the slow travel speeds on NE 145th Street. Buses that serve the NE 145th Street station would travel from NE 155th Street to the NE 145th Street station via 5th Avenue NE. At the NE 145th Street station buses would enter the station to drop off and pick up riders adjacent to the station plaza. Buses would then use the station transit facility to turn around and travel northbound along 5th Avenue NE back to NE 155th Street. Bus platforms and shelters are provided on 5th Avenue NE, one in each direction south of the intersection of 5th Avenue NE at the station egress/I-5 northbound ramps to provide for a potential local route that remains on 5th Avenue NE. Bus stops are provided on NE 145th Street, one in each direction west of NE 145th Street to provide for a potential future bus route on NE 145th Street. In addition to east-west bus service centered on NE 155th Street, King County Metro may also provide service to the station that travels along 5th Avenue NE between NE 145th Street and NE 155th Street. These routes could serve the station either by using the internal station bus bays or by stopping at the bus stops on 5th Avenue adjacent to the station.

Two paratransit stops are provided within the proposed station area along the internal roadway. The stops are adjacent to the proposed station plaza and near the proposed vertical circulation to the station platform. No layover is planned at the NE 145th Street Station; however, the active bus bays would adequately serve

expected 2035 bus service needs for passengers transferring between light rail and buses.

NE 185th Street Station

The restructured bus routes that could provide more frequent service to the NE 145th Street Station could also be rerouted to provide frequent service to the NE 185th Street Station. An existing route on NE 185th Street that currently terminates at the Aurora Village Transit Center could instead be terminated at the NE 185th Street Station. Local transit service on NE 175th Street could be shifted to NE 185th Street. Bus rerouting to NE 175th Street and 5th Avenue NE could require improvements to the tight-turning radius around the northeast corner. This turn is currently problematic for buses.

Community Transit's SR 99 *Swift* bus rapid transit service, which currently terminates at the Aurora Village Transit Center, could be extended to the south and east to terminate at the NE 185th Street Station, providing high-frequency connections to light rail. The plan for bus rapid transit on NE 185th Street includes potential inclusion of transit signal priority treatments. There would be a signal at the intersection of the station driveway at 7th Avenue NE/NE 185th Street to minimize delay to buses and improve safety and mobility for the mix of all modes accessing the station.

A circulating roadway internal to the station would provide access to bus layover spaces and active bus bays. Upon entering the station area there would be four active bus bays adjacent to the station plaza. Buses would circulate around the surface parking to five bus layover spaces. A paratransit stop would also be located adjacent to the station plaza. Two additional active bus bays would be located on NE 185th Street, which would be at the south end of the station plaza. Bus route restructuring to serve the NE 185th Street Station could result in layover activity by Community Transit and King County Metro. The layover space and active bus bays would adequately serve potential bus needs. The active bus bays would also satisfy expected 2035 bus service requirements for the light rail passengers transferring to buses.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station

Local routes stopping at the North Jackson Park-and-Ride lot could be combined with local service parallel to the light rail corridor to provide a more frequent service to the NE 145th Street Station. Local bus riders taking a short trip who are currently on routes parallel to the proposed light rail alignment could experience reduced frequency of service if new routes are not added. Riders who are on local bus routes

and taking a longer trip could benefit by frequent service and a transfer to light rail. Routes selected for rerouting to the light rail stations could be those that currently carry more long-distance riders.

NE 185th Street Station

The combined bus routes developed to provide more frequent service to the NE 145th Street Station could be rerouted to provide frequent service to the NE 185th Street Station. An existing route on NE 185th Street that terminates at the Aurora Village Transit Center could be terminated at the NE 185th Street Station. Local transit service on NE 175th Street could be shifted to NE 185th Street. Bus rerouting to NE 175th Street and 5th Avenue NE could necessitate improvements to the tight-turning radius around the northeast corner. This turn is currently problematic for buses.

Community Transit's SR 99 *Swift* bus rapid transit service, which currently terminates at the Aurora Village Transit Center, could be extended to the south and east to terminate at the NE 185th Street Station, providing high-frequency connections to light rail. Potential transit priority treatments along NE 185th Street could be considered in the Final EIS.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station

Alternative A3 local transit impacts could be the same as with Alternative A1.

NE 185th Street Station

Alternative A3 local transit impacts could be the same as with Alternative A1.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

NE 130th Street Station

Buses on 5th Avenue NE would be provided bus stops within the travel lane between NE 130th Street and the leased park-and-ride. Two new bus stops would be provided on NE 130th Street west of 5th Avenue NE.

NE 155th Street Station

The frequency of the existing route on NE 155th Street, from Lake City to Shoreline Community College, with Alternative A5 could be enhanced with an increase in service frequency.

NE 185th Street Station

Alternative A5 local transit impacts could be the same as with Alternative A1.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

NE 130th Street Station

Alternative A7 local transit impacts could be the same as with Alternative A5.

NE 155th Street Station

Alternative A7 local transit impacts could be the same as with Alternative A5.

NE 185th Street Station

Alternative A7 local transit impacts could be the same as with Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

NE 130th Street Station

Alternative A10 local transit impacts could be similar to Alternative A5, with local service connections to the light rail stations shared between the NE 130th Street Station and NE 145th Street Station.

NE 145th Street Station

Alternative A10 local transit impacts could be similar to Alternative A1, with local service connections to the light rail stations shared between the NE 130th Street Station and NE 145th Street Station.

NE 185th Street Station

Alternative A10 local transit impacts could be the same as Alternative A5.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

NE 130th Street Station

Local transit impacts with Alternative A11 could be the same as with Alternative A7.

NE 145th Street Station

Local transit impacts with Alternative A11 could be the same as with the Preferred Alternative.

NE 185th Street Station

Local transit impacts with Alternative A11 could be the same as with Alternative A3.

Segment B: Shoreline to Mountlake Terrace

Preferred Alternative (B2 Modified): Along I-5 to Lynnwood Park-and-Ride

Mountlake Terrace Transit Center Station

The existing local service is focused on the Mountlake Terrace Transit Center due to its size and connections to existing regional transit service. Therefore, the frequency of local service could be increased as funding allows in order to feed the higher frequency and higher capacity of light rail service with the Preferred Alternative. Buses would enter the transit center at the existing entrance that would be on the west side of the light rail station. Upon entering, there would be two bus bays adjacent to the station platform for loading and unloading. There would also be two active bus bays on 236th Street SW immediately east of the station. The paratransit load/unload area would be located adjacent to the plaza near the north end of the station. The active bus bays would adequately serve expected 2035 bus requirements for passengers transferring from light rail to buses.

Buses that layover at the Mountlake Terrace Transit Center would leave the active bus bay, circulate around the planned surface parking lot, and layover along the exit-only roadway, which would be located approximately 300 feet east of the station entrance. There would be seven bus layover spaces provided to accommodate the conceptual service plans of Community Transit and the regional focus of the Mountlake Terrace Transit Center Station. The surface parking area would be modified to provide a second exit-only driveway for buses. There would be seven layover spaces for a mix of 40-foot buses and 60-foot articulated buses. Eastbound buses on 236th Street SW would not have access to the layover spaces. The expected layover needs range from four spaces for the low transit forecast to eight spaces for the high transit forecast. The length of the layover space in the preliminary design would provide for two layover spaces with independent pull-in/pull-out movement.

220th Street SW Station South Option

The frequency of local service could be increased as funding allows in order to feed the higher frequency and capacity of light rail service. There would be active bus bays located on 220th Street SW adjacent to the station.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median**Mountlake Terrace Transit Center Station**

The impacts to local transit with Alternative B1 would be similar to the Preferred Alternative.

Alternative B2A Modified: with 220th Street SW Station North Option (elevated)**220th Street SW Station North**

The frequency of local service could be increased as funding allows in order to feed the higher frequency and capacity of light rail service. There would be active bus bays located on 220th Street SW adjacent to the station.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median**Mountlake Terrace Freeway Station**

The Mountlake Terrace Freeway flyer stop could be closed and bus routes currently serving the Mountlake Terrace Freeway Station would be eliminated to reduce duplication with light rail service. Local service would be reconfigured to serve the light rail station from arterials. The frequency of local service could be increased as funding allows in order to feed the higher frequency and capacity of light rail service.

Segment C: Mountlake Terrace to Lynnwood***Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride*****Lynnwood Park-and-Ride Station**

The frequency of local service could be increased as funding allows to feed the higher frequency and capacity of light rail service. The existing transit center, with 20 bus bays, serves a mix of active bus bays and layover spaces. An increase of nine layover bus bays would be provided with the Preferred Alternative. The additional bus bays would be provided on the north side of the existing bus transit center where there is an existing surface parking lot. Paratransit load and unload spaces would be provided adjacent to the station plaza along the northeast edge of the surface parking lot. The total number of bus bays with the Preferred Alternative would be adequate for future needs at the Lynnwood Park-and-Ride Station.

Alternative C1: 52nd Avenue West to 200th Street SW

200th Street SW Station

The existing local service is focused on the Lynnwood Transit Center due to its size and connections to existing regional transit service. Therefore, the frequency of local service could be increased as funding allows in order to feed the higher frequency and capacity of light rail service with Alternative C1.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

Lynnwood Transit Center Station

The frequency of local service could be increased as funding allows in order to feed the higher frequency and capacity of light rail service with Alternative C2.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Lynnwood Park-and-Ride Station

The frequency of local service could be increased as funding allows to feed the higher frequency and capacity of light rail service. The existing transit center, with 20 bus bays, serves a mix of active bus bays and layover spaces. An increase of four to six bus bays is expected with the increase in bus arrivals and departures due to light rail transfers. The increased demand for bus bays is not currently included in the concept design. Paratransit load and unload spaces would be provided near the east end of the station and near the circulation route to the station.

5.3 Freeway Operations

This section discusses future projected freeway operations within the project corridor and the potential effects that the project would have on these operations. Key observations and findings include the following:

- Freeway operations were analyzed in detail for the segment of I-5 that extends from south of the NE 130th Street interchange to the city of Lynnwood.
- For the No Build Alternative (forecast year 2035), freeway mainline traffic during peak periods in the peak direction of travel is expected to operate under congested conditions, with AM southbound estimated speeds ranging from 17 mph to 58 mph depending on location within the corridor, and PM northbound estimated speeds ranging from 20 mph south of the NE 130th Street off-ramp to 50 mph north of the 196th Street SW on-ramp in Lynnwood. Although not explicitly evaluated, assuming no change in current HOV policy (e.g., occupancy eligibility), HOV lane speeds and

general performance are also expected to degrade, particularly in the peak direction, affecting reliability and travel times for carpools and buses.

- For the Preferred Alternative (forecast year 2035) during the AM peak hour, freeway speeds and operating conditions are not expected to be substantially affected by the additional traffic generated by the station park-and-ride facilities. Traffic generated by the park-and-rides is expected to be localized and not from longer travel distances along I-5; therefore, little to no additional traffic along I-5 is anticipated with the project. Added station-related traffic on local arterials is generally not expected to cause spillback to nearby intersections or affect I-5 ramp or mainline operations. Vehicle throughput along I-5 is shown to be similar for conditions without the light rail project and the Preferred Alternative.
- During the PM peak hour, the Preferred Alternative would result in some improvements in freeway operations for northbound I-5 due to the reconfiguration of the northbound NE 130th Street off-ramp and the proposed removal of the off-ramp stop control at the intersection with 5th Avenue NE. North of the NE 130th Street off-ramp, speeds along I-5 are projected to be slightly slower as a result of increased vehicle throughput along I-5 due to the improvement at NE 130th Street. In the southbound direction, speeds and vehicle throughput on I-5 would be similar without the light rail project and the Preferred Alternative. In addition, the project would likely reduce the number of buses in the I-5 HOV lanes, thereby providing additional HOV capacity and improving HOV operations and speeds compared to conditions without the project.

5.3.1 Freeway Volumes

For the No Build Alternative (forecast year 2035), freeway volumes were estimated using growth rates derived from the PSRC Travel Demand Model: WSDOT Project Version. Growth rates were applied directly to existing traffic volumes along with minor refinements and modeled in VISSIM traffic simulation software. The VISSIM model framework was prepared and calibrated for existing conditions from the NE 130th Street interchange to the city of Lynnwood, just south of the I-405/I-5 interchange. Estimated 2035 freeway mainline and ramp volumes are shown in Figures 5-14, 5-15, and 5-16 for both the AM and PM peak hours.

Year 2035 I-5 mainline volumes between the NE 130th Street interchange and the city of Lynnwood are expected to increase by approximately 3 to 8 percent from existing conditions with the exception of the northbound (off-peak) direction in the AM peak hour, which are projected to increase by approximately 10 to 15 percent from existing conditions. These volume forecasts reflect higher growth in travel demand. The highest demand is expected in the northbound direction during the AM peak hour because in this segment I-5 is currently not operating at capacity and therefore has greater potential for growth.

Traffic volumes with each light rail alternative are mainly generated by station area trip activity, which includes traffic to and from the park-and-ride facilities and passenger pick-ups and drop-offs. Users destined for this station area are assumed to arrive at the station primarily through local streets and arterials. Changes in freeway operations with the light rail alternatives could result from reconstruction and geometric changes at the interchanges and, in some cases, congestion on the local streets could affect I-5 off-ramps and subsequently the I-5 mainline. NE 130th Street, NE 145th Street, and 200th Street SW are the three interchanges with proposed modifications to the interchange and/or ramp terminal intersections.

Freeway Speeds and Level of Service

By 2035, freeway operating conditions near the NE 130th Street and NE 145th Street interchange areas would degrade from current conditions which, as previously described, are already congested. Freeway speeds and densities are an output of the VISSIM analysis and are a direct reflection of congestion. LOS is calculated from the density estimates based on the *Highway Capacity Manual* methodology. Tables 5-16 and 5-17 show the AM peak hour freeway speeds and LOS for the No Build Alternative and light rail alternatives for Segment A in forecast year 2035, respectively; Tables 5-21 and 5-22 show PM peak hour speeds and LOS; and Figures 5-20, 5-21, and 5-22 indicate the freeway segment locations. The results are discussed below.

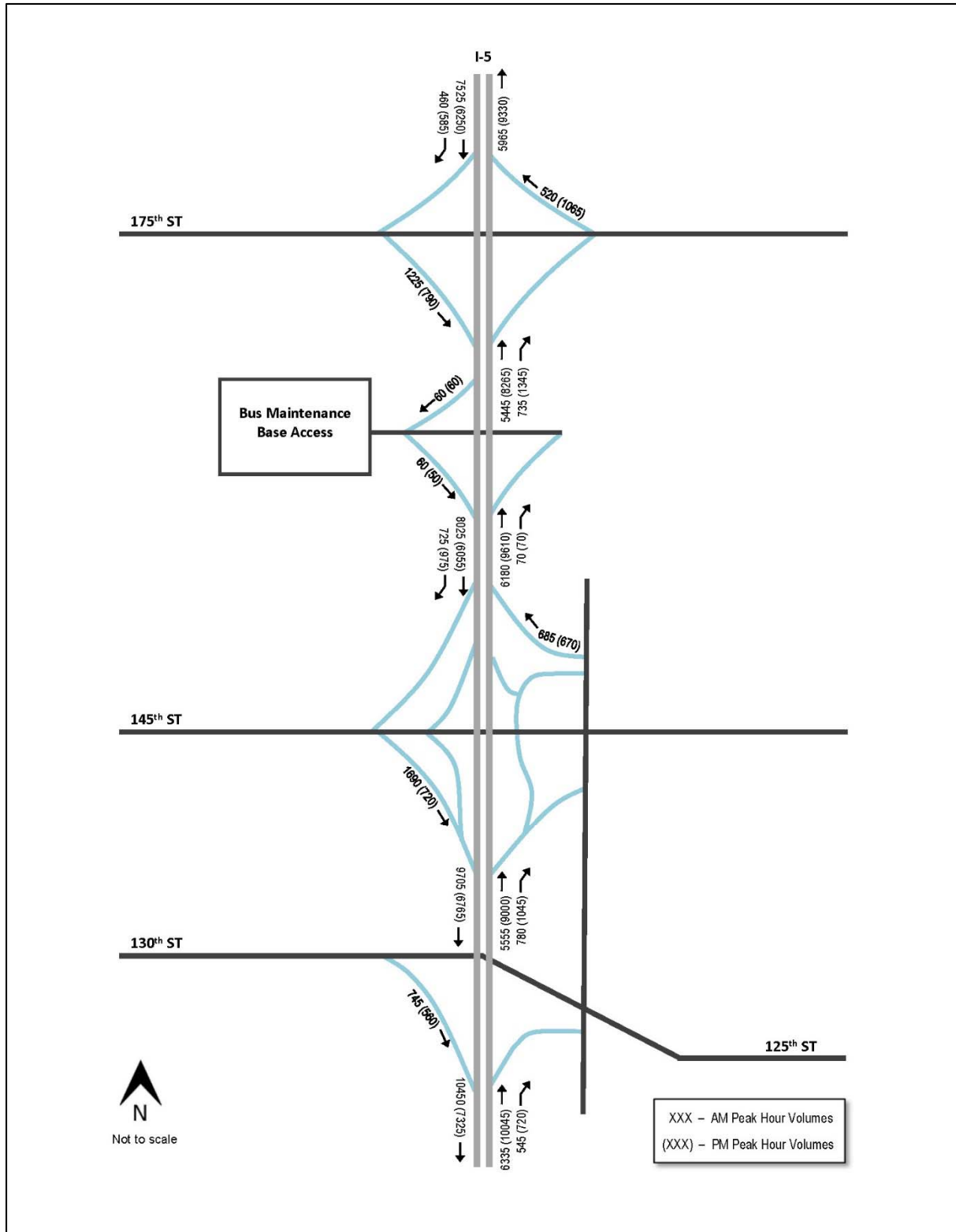


Figure 5-14. 2035 (Segment A) Peak Hour Freeway Volumes

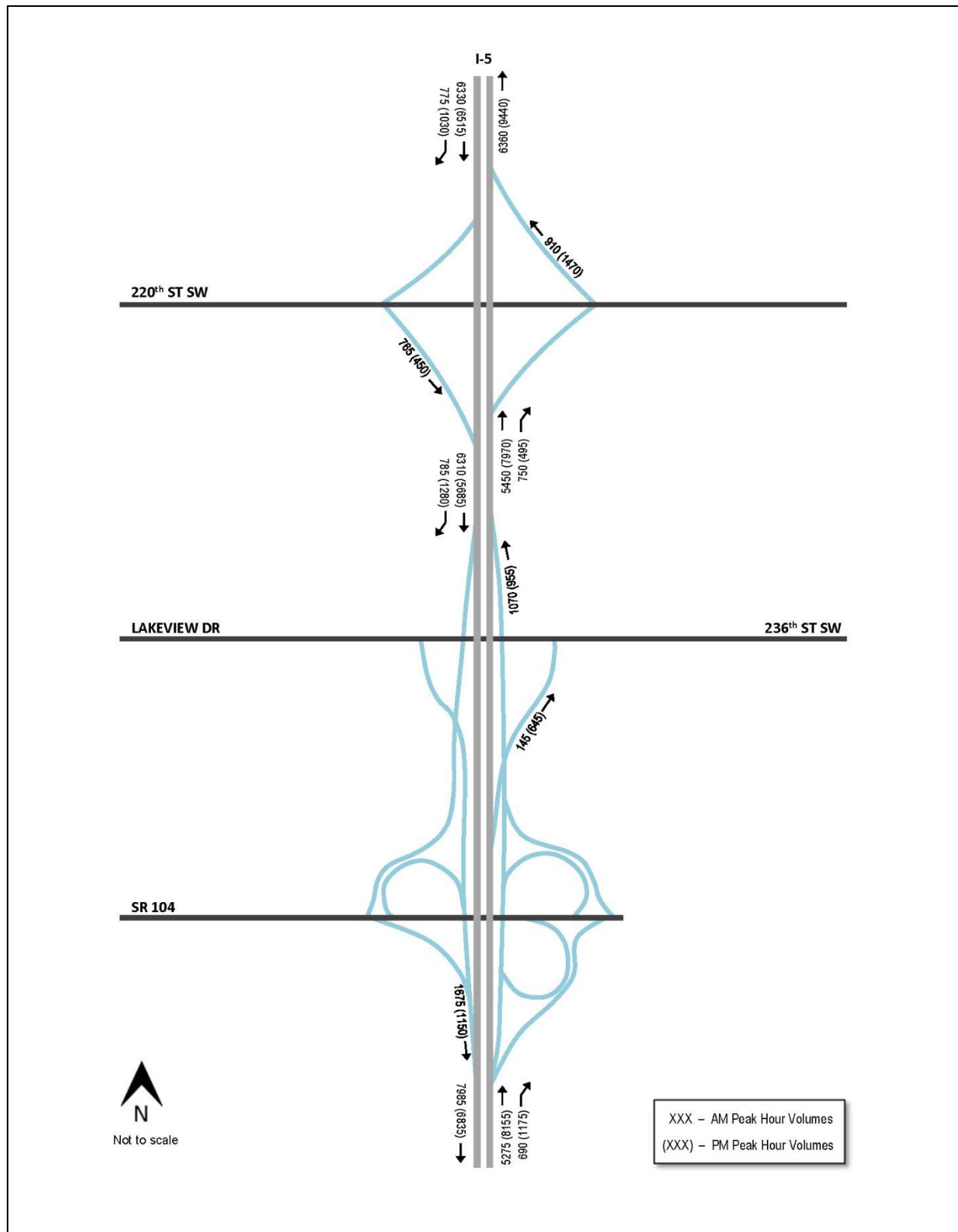


Figure 5-15. 2035 (Segment B) Peak Hour Freeway Volumes

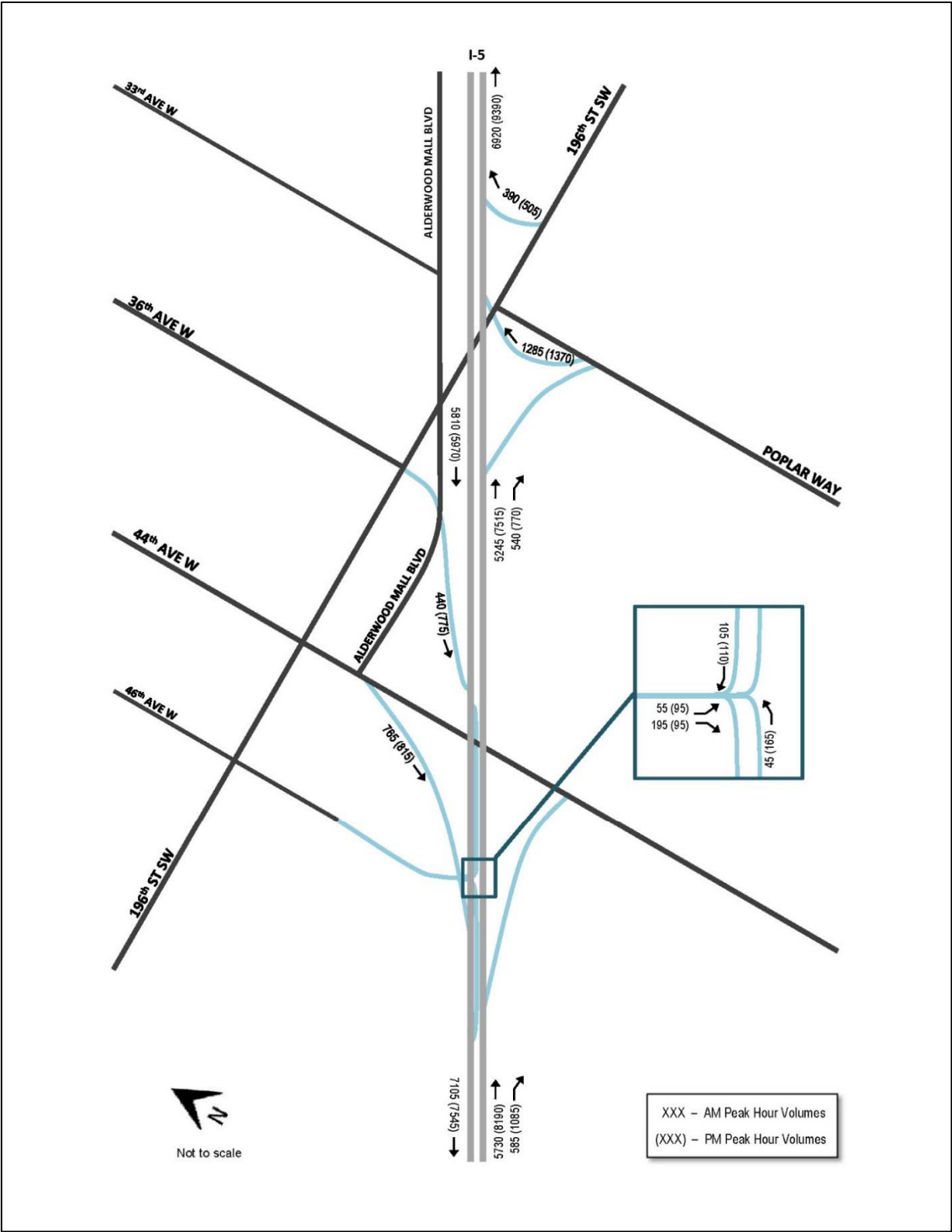


Figure 5-16. 2035 (Segment C) Peak Hour Freeway Volumes

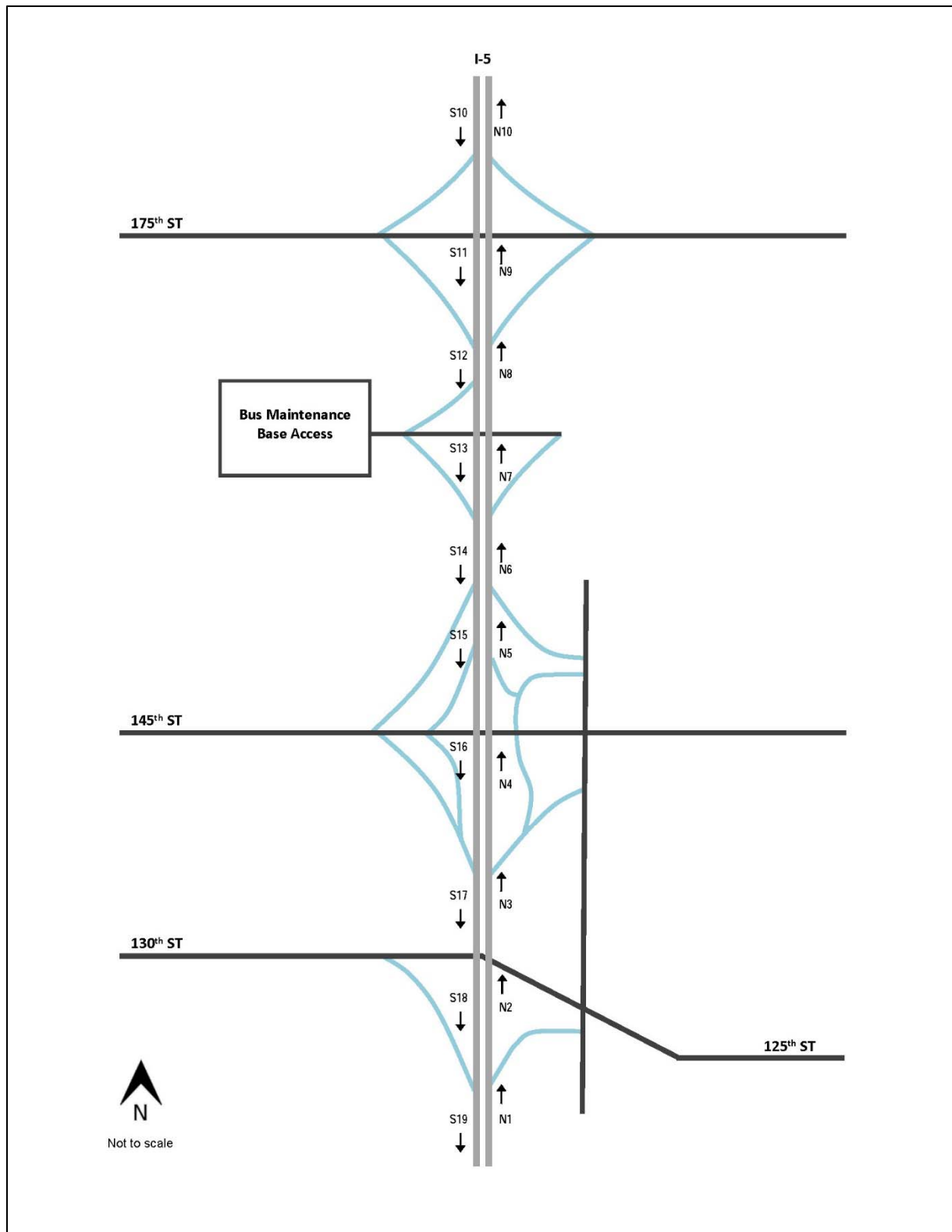


Figure 5-17. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment A)

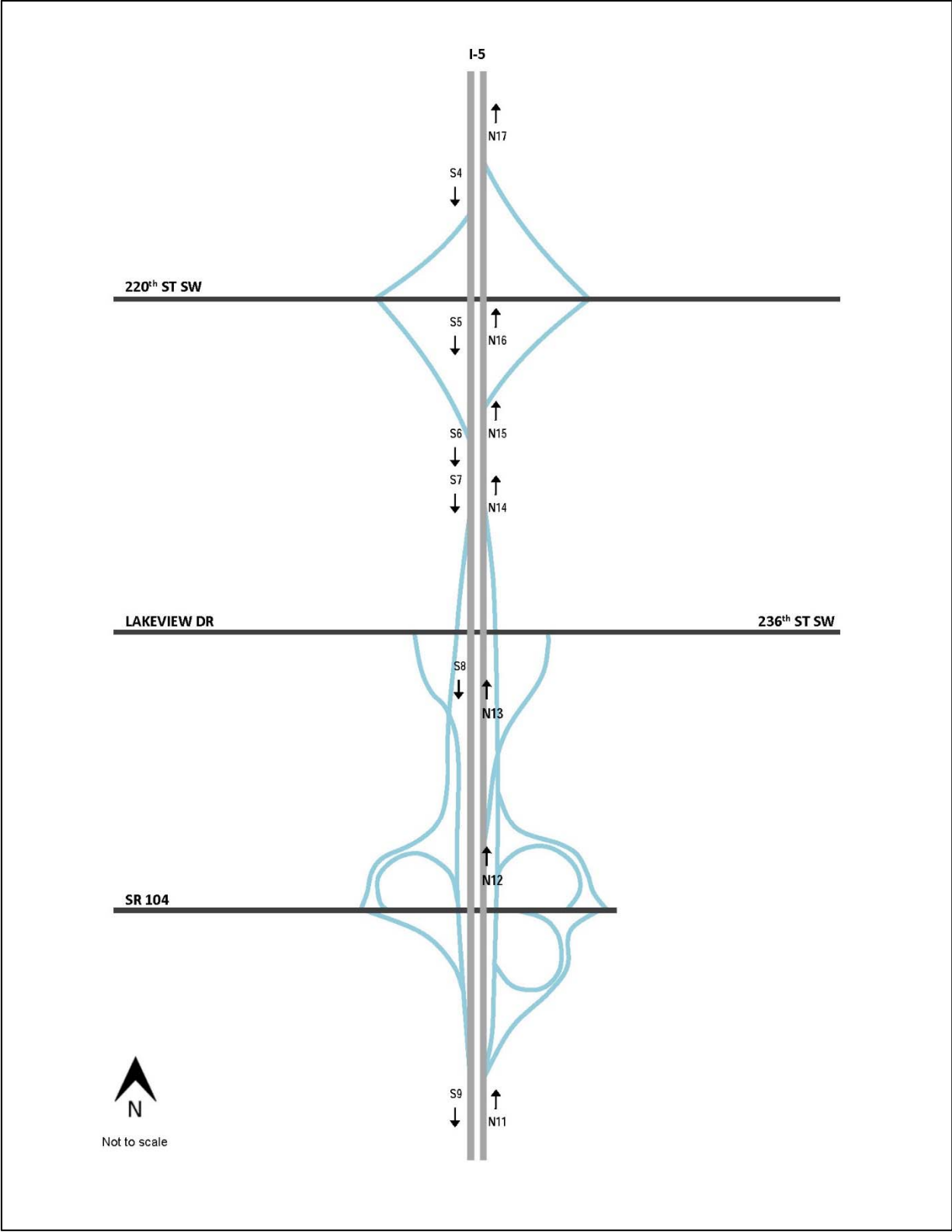


Figure 5-18. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment B)

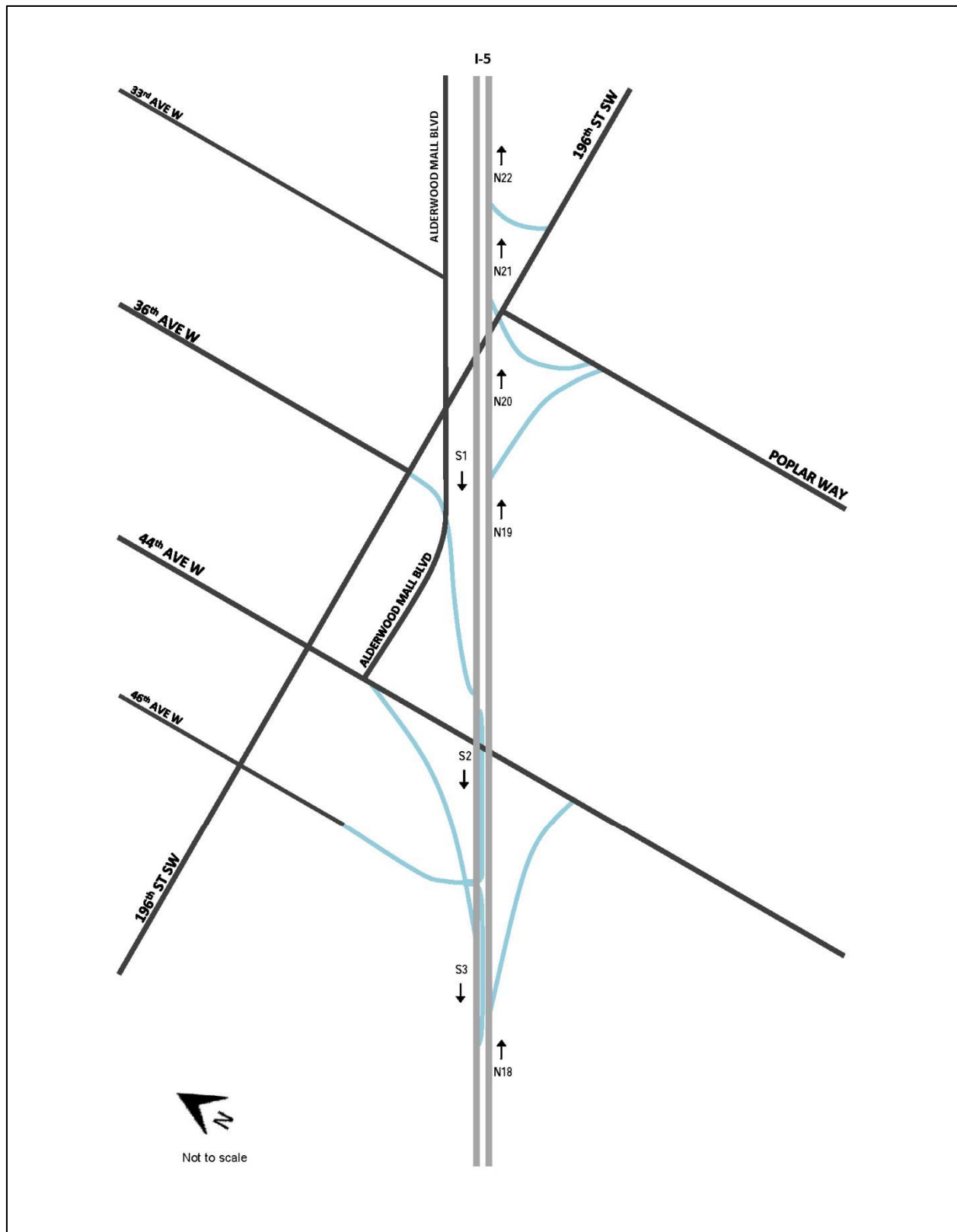


Figure 5-19. I-5 Freeway Segment IDs for Freeway Operations Analysis (Segment C)

Table 5-19. Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment A)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with Options ^a	Alternative A1	Alternative A3	Alternative A5	Alternative A7	Alternative A10	Alternative A11
N1	Northbound, Northgate on-ramp to NE 130th Street off-ramp	Weave	52 / 23	53 / 26	53 / 27	53 / 30	53 / 24	53 / 27	53 / 23	53 / 32	52 / 19
N2	Northbound, north of NE 130th Street off-ramp	Segment	52 / 29	52 / 27	52 / 27	52 / 30	52 / 32	52 / 28	52 / 29	52 / 32	52 / 31
N3	Northbound, NE 145th Street off-ramp	Diverge	51 / 26	51 / 25	51 / 25	51 / 27	51 / 30	51 / 26	51 / 26	51 / 28	51 / 28
N4	Northbound, NE 145th Street off-ramp to NE 145th Street on-ramp	Segment	56 / 22	56 / 23	56 / 22	56 / 25	56 / 29	56 / 22	56 / 23	56 / 25	56 / 26
N5	Northbound, north of NE 145th Street transit on-ramp	Merge	56 / 18	56 / 20	56 / 19	56 / 22	56 / 25	56 / 19	56 / 20	56 / 21	56 / 22
N6	Northbound, north of NE 145th Street on-ramp	Merge	54 / 17	54 / 19	54 / 17	54 / 20	54 / 22	54 / 17	54 / 18	54 / 19	54 / 20
N7	Northbound, north of NE 155th Street off-ramp	Segment	52 / 21	52 / 23	52 / 22	52 / 24	52 / 24	52 / 22	52 / 22	52 / 23	52 / 23
N8	Northbound, NE 175th off-ramp	Diverge	51 / 20	51 / 21	51 / 21	51 / 22	51 / 22	51 / 21	51 / 20	51 / 21	51 / 20
N9	Northbound, north of the NE 175th off-ramp	Segment	53 / 26	52 / 29	53 / 37	53 / 36	53 / 30	53 / 33	53 / 37	53 / 32	53 / 28
N10	Northbound, north of the NE 175th on-ramp	Merge	53 / 22	53 / 26	53 / 32	53 / 32	53 / 27	53 / 29	53 / 32	53 / 28	53 / 25

Table 5-19. Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment A)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with Options ^a	Alternative A1	Alternative A3	Alternative A5	Alternative A7	Alternative A10	Alternative A11
S10	Southbound, north of NE 175th Street off-ramp	Diverge	32 / 55	30 / 56	30 / 56	30 / 56	32 / 56	27 / 56	30 / 56	29 / 55	32 / 55
S11	Southbound, south of NE 175th Street off-ramp	Segment	25 / 57	24 / 57	24 / 57	24 / 57	24 / 57	23 / 55	22 / 57	24 / 57	26 / 57
S12	Southbound, south of NE 175th Street on-ramp	Merge	28 / 53	29 / 54	27 / 52	27 / 53	27 / 54	25 / 50	28 / 53	26 / 53	27 / 53
S13	Southbound, south of NE 155th off-ramp	Segment	33 / 57	35 / 57	32 / 53	32 / 56	32 / 55	29 / 52	34 / 57	30 / 56	31 / 57
S14	Southbound, north of NE 145th Street off-ramp	Diverge	29 / 47	31 / 45	28 / 42	28 / 45	29 / 46	27 / 43	31 / 46	28 / 41	28 / 47
S15	Southbound, north of NE 145th Street transit off-ramp	Diverge	31 / 54	30 / 53	28 / 53	28 / 53	28 / 54	26 / 53	28 / 53	27 / 52	28 / 53
S16	Southbound, NE 145th Street off-ramp to NE 145th Street on-ramp	Segment	24 / 58	25 / 58	23 / 58	23 / 58	23 / 58	22 / 58	24 / 58	22 / 58	23 / 58
S17	Southbound, south of NE 145th Street on-ramp	Merge	19 / 58	20 / 58	18 / 58	18 / 58	19 / 58	18 / 58	19 / 58	18 / 58	18 / 58
S18	Southbound, north of NE 130th Street on-ramp	Segment	17 / 58	18 / 58	17 / 58	17 / 58	17 / 58	17 / 58	18 / 58	17 / 58	17 / 58
S19	Southbound, south of NE 130th Street on-ramp	Merge	23 / 52	24 / 52	22 / 52	22 / 52	23 / 53	23 / 52	23 / 52	22 / 52	22 / 53

^a Preferred Alternative with options includes a NE 130th Street Station.

Table 5-20. Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment A)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with Options*	Alternative A1	Alternative A3	Alternative A5	Alternative A7	Alternative A10	Alternative A11
N1	Northbound, Northgate on-ramp to NE 130th Street off-ramp	Weave	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N2	Northbound, north of NE 130th Street off-ramp	Segment	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / E
N3	Northbound, NE 145th Street off-ramp	Diverge	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N4	Northbound, NE 145th Street off-ramp to NE 145th Street on-ramp	Segment	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N5	Northbound, north of NE 145th Street transit on-ramp	Merge	B / F	B / F	B / F	B / F	B / F	B / F	B / F	B / F	B / F
N6	Northbound, north of NE 145th Street on-ramp	Merge	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N7	Northbound, north of NE 155th Street off-ramp	Segment	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N8	Northbound, NE 175th off-ramp	Diverge	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N9	Northbound, north of the Ne 175th off-ramp	Segment	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F
N10	Northbound, north of the NE 175th on-ramp	Merge	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F	C / F

Table 5-20. Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment A)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with Options*	Alternative A1	Alternative A3	Alternative A5	Alternative A7	Alternative A10	Alternative A11
S10	Southbound, north of NE 175th Street off-ramp	Diverge	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D
S11	Southbound, south of NE 175th Street off-ramp	Segment	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D
S12	Southbound, south of NE 175th Street on-ramp	Merge	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D
S13	Southbound, south of NE 155th off-ramp	Segment	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D
S14	Southbound, north of NE 145th Street off-ramp	Diverge	F / E	F / E	F / E	F / E	F / E	F / E	F / E	F / E	F / E
S15	Southbound, north of NE 145th Street transit off-ramp	Diverge	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D	F / D
S16	Southbound, NE 145th Street off-ramp to NE 145th Street on-ramp	Segment	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C
S17	Southbound, south of NE 145th Street on-ramp	Merge	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C
S18	Southbound, north of NE 130th Street on-ramp	Segment	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C
S19	Southbound, south of NE 130th Street on-ramp	Merge	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C	F / C

* Preferred Alternative with options includes a NE 130th Street Station

Table 5-21. Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment B)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative w/ Options*
N11	Northbound, SR 104 off-ramp	Diverge	53 / 18	53 / 19	53 / 21
N12	Northbound, 236th Street SW off-ramp	Diverge	53 / 33	53 / 28	53 / 28
N13	Northbound, north of 236th Street SW off-ramp	Segment	53 / 26	54 / 24	55 / 23
N14	Northbound, SR 104 on-ramp	Merge	44 / 36	48 / 34	48 / 33
N15	Northbound, 220th Street SW off-ramp	Diverge	50 / 43	46 / 38	44 / 37
N16	Northbound, north of 220th Street SW off-ramp	Segment	54 / 47	54 / 44	54 / 43
N17	Northbound, 220th Street SW on-ramp	Merge	53 / 40	53 / 39	54 / 40
S4	Southbound, 220th Street SW off-ramp	Diverge	54 / 47	52 / 49	52 / 49
S5	Southbound, south of 220th Street SW off-ramp	Segment	57 / 57	57 / 57	57 / 57
S6	Southbound, 220th Street SW on-ramp	Merge	52 / 53	52 / 52	52 / 52
S7	Southbound, SR 104 off-ramp	Diverge	56 / 54	56 / 54	56 / 53
S8	Southbound, south of SR 104 off-ramp	Segment	57 / 58	58 / 58	54 / 58
S9	Southbound, SR 104 on-ramp	Merge	32 / 56	33 / 56	31 / 57

* Preferred Alternative with options includes a 220th Street Station with a 200 space park-and-ride lot

Table 5-22. Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment B)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative w/ Options*
N11	Northbound, SR 104 off-ramp	Diverge	C / F	C / F	C / F
N12	Northbound, 236th Street SW off-ramp	Diverge	C / F	C / F	C / F
N13	Northbound, north of 236th Street SW off-ramp	Segment	C / F	C / F	C / F
N14	Northbound, SR 104 on-ramp	Merge	D / F	D / F	D / F
N15	Northbound, 220th Street SW off-ramp	Diverge	D / E	D / F	D / F
N16	Northbound, north of 220th Street SW off-ramp	Segment	C / E	C / E	C / E
N17	Northbound, 220th Street SW on-ramp	Merge	C / E	C / F	C / F
S4	Southbound, 220th Street SW off-ramp	Diverge	D / E	D / E	D / E
S5	Southbound, south of 220th Street SW off-ramp	Segment	D / D	D / D	D / D
S6	Southbound, 220th Street SW on-ramp	Merge	D / D	D / D	D / D
S7	Southbound, SR 104 off-ramp	Diverge	D / D	D / D	D / D
S8	Southbound, south of SR 104 off-ramp	Segment	D / C	D / C	D / C
S9	Southbound, SR 104 on-ramp	Merge	F / D	F / D	F / D

* Preferred Alternative with options includes a 220th Street Station with a 200-space park-and-ride lot.

Table 5-23. Forecast Year 2035 AM/PM Peak Hour Freeway Speeds (Segment C)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with 400 additional parking spaces
N18	Northbound, 44th Avenue West off-ramp	Diverge	51 / 38	52 / 37	51 / 41
N19	Northbound, 196th Street SW off-ramp	Diverge	51 / 39	51 / 37	51 / 39
N20	Northbound, north of 196th Street SW off-ramp	Segment	54 / 48	55 / 48	55 / 48
N21	Northbound, 196th Street SW eastbound on-ramp	Merge	56 / 51	56 / 51	56 / 52
N22	Northbound, 196th Street SW westbound on-ramp	Merge	54 / 44	55 / 44	55 / 45
S1	Southbound, north of 196th Street SW on-ramp	Segment	58 / 58	58 / 58	58 / 58
S2	Southbound, 196th Street SW on-ramp	Merge	57 / 55	57 / 56	57 / 56
S3	Southbound, 44th Avenue W on-ramp	Merge	56 / 56	56 / 56	56 / 56

Table 5-24. Forecast Year 2035 AM/PM Peak Hour Freeway LOS (Segment C)

ID	I-5 Segment	Segment Type	No Build Alternative	Preferred Alternative	Preferred Alternative with 400 additional parking spaces
N18	Northbound, 44th Avenue West off-ramp	Diverge	C / F	C / F	C / E
N19	Northbound, 196th Street SW off-ramp	Diverge	D / F	D / F	D / F
N20	Northbound, north of 196th Street SW off-ramp	Segment	C / E	C / D	C / D
N21	Northbound, 196th Street SW eastbound on-ramp	Merge	C / D	C / D	C / D
N22	Northbound, 196th Street SW westbound on-ramp	Merge	C / E	C / E	C / E
S1	Southbound, north of 196th Street SW on-ramp	Segment	C / C	C / C	C / C
S2	Southbound, 196th Street SW on-ramp	Merge	C / D	C / D	C / D
S3	Southbound, 44th Avenue West on-ramp	Merge	C / C	C / C	C / C

Freeway Operations for the No Build Alternative

During the AM peak hour, average vehicle speeds on southbound I-5 would be approximately 35 mph or slower with the No Build Alternative (forecast year 2035) south of the SR 104 interchange. As with existing conditions, mainline congestion would be the result of high levels of entering and exiting traffic. The southbound on-ramps at NE 145th Street and SR 104 draw heavy demands that cause reduced speeds at critical merge areas. In the northbound (off-peak) direction, I-5 would operate with average speeds ranging from 44 mph to 56 mph. These congested conditions for the southbound direction are also reflected in the LOS ratings that are LOS D to F. The northbound direction would generally operate at LOS C, indicating free-flow conditions.

During the PM peak hour, average northbound travel speeds would range from approximately 17 mph south of the NE 130th Street off-ramp to approximately 51 mph in Lynnwood. I-5 would continue to operate under highly congested conditions (LOS E and F), with high volumes of merging and diverging traffic causing delay and spillback on the I-5 mainline. In particular, merging and diverging activity near the off-ramps to NE 130th Street, NE 175th Street, and SR 104 would cause noticeable mainline disruptions with average speeds reducing to 20 mph or less.

Southbound (off-peak) speeds on I-5 would range from approximately 45 mph to 55 mph within the area analyzed. On the freeway mainline segment approaching NE 145th Street, southbound off-ramp volumes would cause delays and queues that extend onto the freeway mainline. Similar to existing conditions, I-5 traffic south of the NE 130th Street and Northgate interchanges would slow noticeably in the PM peak hour caused by the HOV lane merging into the general purpose lanes (due to the express lanes operating northbound during this time period), traffic from the Northgate interchange merging in, a lane drop to NE 85th/80th Streets, and congestion-related backups from as far south as downtown Seattle and beyond. This level of congestion is expected to become worse in the future and would result in unstable and unreliable flow conditions, travel times, and speeds.

Freeway Operations for the Light Rail Alternatives

Segment A: Seattle to Shoreline

For the Preferred Alternative during the AM peak hour, freeway speeds and operations are not expected to be affected by the additional traffic generated by the park-and-ride lot at the NE 145th Street Station because few trips to and from the light rail station are expected to use I-5. Some additional congestion is anticipated along the local arterials but this is not expected to affect I-5 operations. For the other light rail alternatives for Segment A, the freeway operations are not anticipated

to be affected by the traffic generated from the light rail station. In addition to speeds and LOS, the vehicle throughput on I-5 is similar under the No Build Alternative and all the light rail alternatives.

Similar to the AM peak hour, the Preferred Alternative in the PM peak hour is not anticipated to increase congestion along I-5. However, operations along northbound I-5 at NE 130th Street off-ramp would improve due to the grade separation of the northbound NE 130th Street off-ramp with southbound 5th Avenue NE and the resulting removal of the off-ramp stop control at the intersection with 5th Avenue NE. Northbound travel speeds approaching NE 130th Street could improve by approximately 5 mph. Speeds north of this off-ramp could decrease as increased traffic throughput is facilitated due to the removal of the bottleneck at the off-ramp, but not due to increased congestion at the interchanges to the north. The travel times along I-5 from south of the NE 130th Street interchange to north of the NE 145th Street interchange are not anticipated to change as a result of the Preferred Alternative. The three at-grade alternatives (Alternatives A1, A5, and A10) would operate similar to the Preferred Alternative at the NE 130th Street off-ramp due to the ramp reconfiguration. Alternatives A7 and A11, with an elevated guideway and a station at NE 130th Street, do not include the NE 130th Street off-ramp reconstruction and would potentially result in degraded I-5 operations as the existing ramp terminus configuration could be affected by local street congestion.

During the PM peak hour in the southbound direction, speeds on I-5 for the Preferred Alternative are not anticipated to decrease. The local street congestion at the NE 145th Street Station is not anticipated to spill back onto I-5. With the exception of Alternative A10, the other alternatives are not anticipated to affect I-5 operations. Alternative A10 includes a different NE 145th Street Station configuration than the Preferred Alternative and an additional 150 parking stalls could cause a slight decrease in I-5 speeds approaching the southbound off-ramp. The increased local street traffic associated with the park-and-ride facility would cause increased intersection delay that could worsen the congestion on the southbound NE 145th Street off-ramp and on I-5 near the ramp diverge. The increase in travel times for southbound I-5 trips between NE 155th Street and NE 145th Street is estimated at less than a minute. This slight increase in delay would be eliminated with mitigation. Potential measures for mitigating these impacts focus on improving local street intersection operations, which are described in Section 9.3, Freeway, in Chapter 9, Potential Mitigation Measures.

In addition, the project would likely reduce the number of buses in the I-5 HOV lanes, which would create additional HOV capacity and improve HOV operations and speeds compared with the No Build Alternative. The benefits to the HOV lane would likely be similar for all light rail alternatives.

Segment B: Shoreline to Mountlake Terrace

The Preferred Alternative between Shoreline and Mountlake Terrace is not anticipated to generate additional trips along I-5. Trips generated by the NE 185th Street and Mountlake Terrace Stations are anticipated to use the local arterial system to access the stations. Therefore, I-5 volumes are expected to be similar to the No Build Alternative. At the 220th Street SW interchange, the Preferred Alternative moves the southbound ramp terminus intersection farther east. This change in configuration does not affect the merge-and-diverge areas with I-5 but reduces the distance between the northbound and southbound ramp intersections at 220th Street SW. Queuing and storage distance between the two intersections is expected to be sufficient and not cause any additional delay along 220th Street SW or to the I-5 ramps.

In addition, an analysis of the Preferred Alternative with an optional 220th Station was performed for I-5. This alternative has a station at 220th Street SW but does not move the southbound ramp terminus intersection. Similar to the Preferred Alternative, impacts on I-5 are not anticipated as a result of a station at 220th Street SW.

Segment C: Mountlake Terrace to Lynnwood

The four segment C alternatives, including the Preferred Alternative, for the Lynnwood Station are expected to have similar operations along I-5 because the trip generation and station access to the arterial system is the same across the alternatives. The majority of trips being generated by the additional park-and-ride capacity would use the local arterial system. However, some trips are anticipated to use I-5 via the 44th Avenue West ramps, the 196th Street SW ramps, or the HOV direct access ramps to access the station. These additional I-5 trips are projected to be very minor and have minimal effect on I-5 operations. The additional surface street traffic is not projected to cause spillback onto the ramps. The AM and PM peak hour speeds and vehicle throughput are similar for the No Build Alternative and light rail alternatives.

An analysis was performed along I-5 for the Preferred Alternative with an options scenario that includes an additional 400 park-and-ride spaces over the capacity the Preferred Alternative provides. The increase in traffic would cause some additional congestion along the arterial streets but this is not anticipated to affect I-5 operations.

The remaining alternatives are expected to have similar I-5 operations to the Preferred Alternative.

5.4 Arterials and Local Streets

This section describes the impacts of the No Build Alternative, the Preferred Alternative and other light rail alternatives on arterials and local streets. The evaluation included development of forecast year 2035 traffic volumes, LOS analysis,

and identification of changes to access and circulation that would result from the project alternatives. The focus of the analysis in this section is on areas around each proposed station and along the alternative routes. Key observations and findings related to this section include the following:

- Background traffic volumes through the project corridor are expected to increase by approximately 0.7 to 1.3 percent per year between 2012 and 2035, with the highest growth anticipated in Segment C.
- The amount of traffic generated by the project is projected to be the highest at stations providing the greatest number of new park-and-ride spaces. These include the NE 145th Street, NE 155th Street, NE 185th Street, and Lynnwood Transit Center Stations. Overall, trip generation is expected to be the highest at the Lynnwood Transit Center Station because this station would serve as the northern terminus of the Lynnwood Link Extension, provide the highest overall number of park-and-ride spaces, and is expected to generate the highest station ridership.
- In 2035, intersections near the proposed light rail stations are expected to operate at LOS conditions similar to the No Build Alternative. Exceptions exist primarily near the Segment A stations, with a few isolated locations in Segment C.

5.4.1 Traffic Volume Forecasts

No Build Alternative

Travel demand forecasts for 2035 were developed for the Lynnwood Link Extension based on PSRC's current population and land use forecasts. The methodology used in developing these forecasts is described in detail in the *Transit Ridership Forecasting Interim Technical Report* (Sound Transit 2012).

Existing turning-movement count information and annual compounded growth rates developed from the Lynnwood Link Extension travel demand model were used to develop 2035 AM and PM peak-hour turning movements for the study intersections.

Overall, by 2035, traffic volumes in Segment A for the No Build Alternative are predicted to increase by an average annual growth rate of approximately 0.8 percent in the AM and PM peak hours. Traffic volumes in Segment B are projected to increase by approximately 0.9 percent and 0.7 percent per year in the AM and PM peak hours, respectively. In Segment C, traffic volumes are expected to increase by approximately 1.3 percent and 1 percent in the AM and PM peak hours, respectively. Traffic volumes are summarized for the No Build and Build Alternatives in Appendix C.

Light Rail Alternatives

For the light rail alternatives (including the Preferred Alternative), trips generated by light rail station usage were calculated for each station and added to the No Build Alternative's estimated volumes for 2035. Trip generation for each station comprises automobile trips to and from park-and-ride lots, passenger drop-off/pick-up trips, and new bus trips.

For the light rail alternatives, additional traffic would be generated by new or modified park-and-ride facilities. Table 5-25 shows existing and proposed park-and-ride capacities associated with each station. As shown in Table 5-25, park-and-ride spaces would be provided at all stations, except at the NE 130th Street Station with Alternative A10. For stations with park-and-ride lots, the number of park-and-ride spaces provided is expected to increase over existing capacities at all stations except the Mountlake Terrace Station. This station would maintain the number of existing parking spaces except with Alternative B1 with option.

For all proposed park-and-ride stations, it was assumed that the number of new park-and-ride vehicle trips generated during a 3-hour peak period would be equal to the net increase in park-and-ride stalls provided at each station. If the park-and-ride facility is an existing lot, the total number of new park-and-ride trips is the difference between the total number of proposed stalls and the total number of existing stalls. This assumption was applied to all park-and-ride lots in the study area and provides a conservatively high assessment of traffic impacts near the stations because all available parking stalls are assumed to be fully utilized. For the traffic analysis, it was assumed that 0.50 trips per occupied space would be generated during the AM peak hour and 0.45 trips per occupied space would be generated during the PM peak hour. These rates are consistent with survey data from Sound Transit's commuter rail stations, Central Link light rail park-and-ride, and trip generation from light rail transit park-and-ride lots in other rail systems in the United States.

Vehicle trips generated by passenger drop-off/pick-up activity are not constrained by the number of parking spaces at the park-and-ride lots and instead are more directly related to station ridership and mode of access. The Sound Transit Ridership Model was used to assign ridership to various modes of travel based on data from the 2008 BART Station Profile Study and recent data collected from the Tukwila park-and-ride station. Using this method, 16 percent of the total PM peak period ridership at each proposed station was used to calculate the estimated passenger drop-off/pick-up volumes.

Bus route trips were estimated from King County Metro's and Community Transit's conceptual 2025 transit integration plans to support planning for the Lynnwood Link Extension.

In general, the highest trip-generating stations are those providing the highest number of new park-and-ride spaces. These include the NE 145th Street, NE 155th Street, NE 185th Street, and Lynnwood Transit Center Stations. Overall, trip generation is expected to be the highest at the Lynnwood Transit Center Station because this station would serve as the northern terminus of the Lynnwood Link Extension, provide the highest overall number of park-and-ride spaces, and is expected to generate the highest station ridership.

The peak-hour vehicle trips generated at each proposed station area were assigned to study area roadways and intersections based on existing travel patterns, station access, and bus route assumptions provided by King County and/or Community Transit for each station.

Table 5-25. Existing and Proposed Park-and-Ride Capacity

Segment/Station	Station Option	Alternative	Number of Park-and-Ride Spaces		
			Existing	Proposed	Net Change
Segment A					
NE 130th Street Station	Option 1—At-grade, with park-and-ride	Preferred Alternative with option, A5	46	100 ^a	+54
	Option 1—At-grade, no park-and-ride	A10,	46	0	-46
	Option 2—Elevated	A7, A11	46	142	+96
NE 145th Street Station	Option 1—Elevated, 500 park-and-ride spaces	A1	68	500	+432
	Option 1—Elevated, 650 park-and-ride spaces	A10	68	650	+582
	Option 2—Elevated	Preferred Alternative, A3, A11	68	500	+432
NE 155th Street Station	Elevated	A5, A7	0	500	+500
NE 185th Street Station	Options 1 and 2	Preferred Alternative, A1, A3, A7, A11	0	500	+500
	Option 3	A5, A10	0	350	+350
Segment B					
Mountlake Terrace Station	Transit Center Station—Elevated	Preferred Alternative, B1, B2A	880	880	0
	Freeway Station—At-Grade	B4	880	880	0
Mountlake Terrace Station	Transit Center Station—Elevated	B1 with option	880	1,160	+280
220th Street Station—Optional	Elevated	Preferred Alternative with option, B2A	0	200	+200
Segment C					
Lynnwood Transit Center Station	200th Street SW—Elevated	C1	1,370	1,900	+530
	Transit Center—Elevated	C2	1,370	1,900	+530
	Park-and-Ride Option 1—Elevated	C3 (Option 1)	1,370	1,900	+530
	Park-and-Ride Option 2—Elevated	Preferred Alternative, C3 Modified	1,370	1,900	+530
	Park-and-Ride Option 2—Elevated	Preferred Alternative with option	1,370	2,400	+1,030

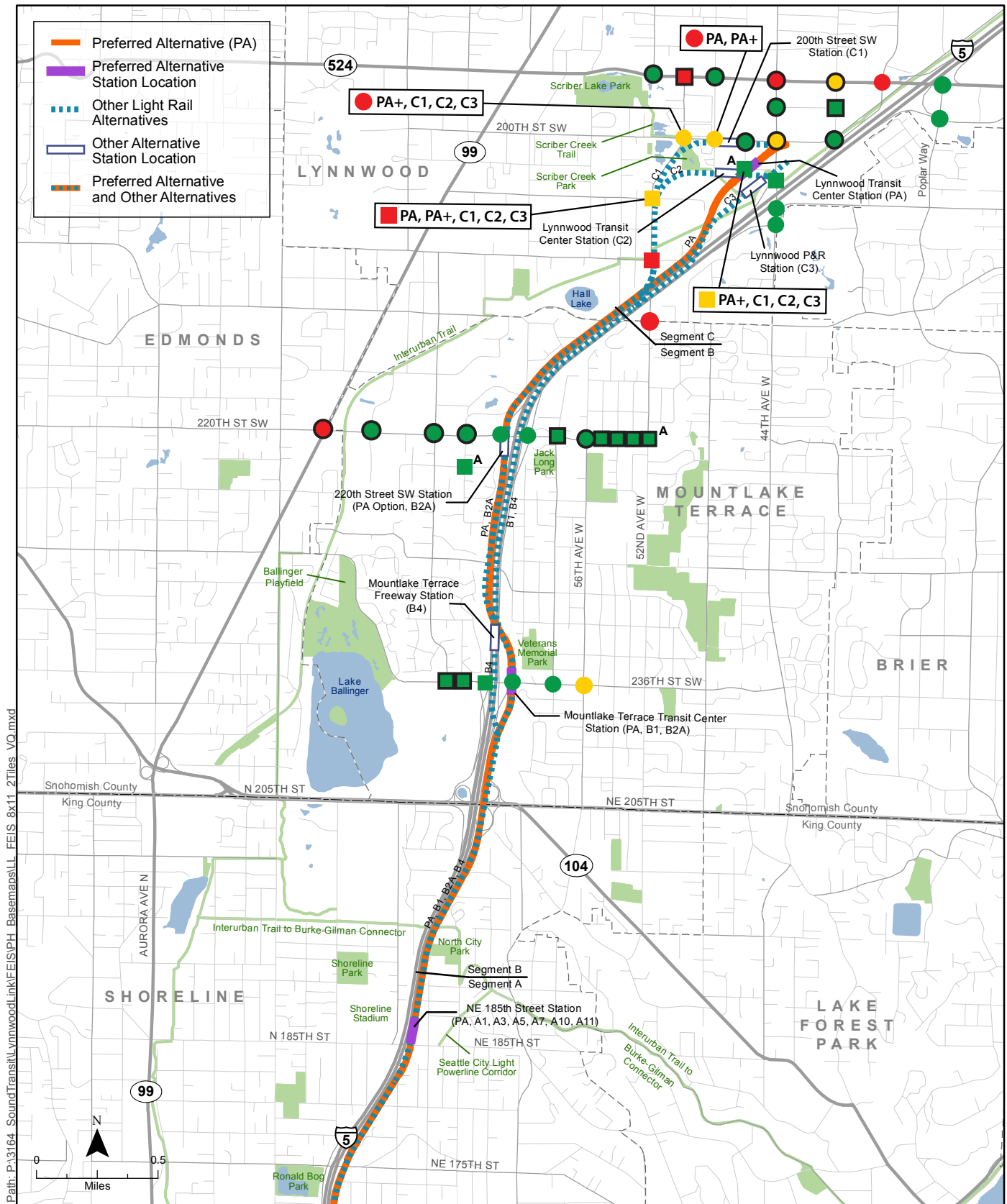
^a Possible surface parking lot available for lease located adjacent to the station.

5.4.2 Traffic Operations

The traffic operations analysis compares the No Build Alternative and light rail alternatives in forecast year 2035 in the study area. Sound Transit selected the locations evaluated with input from the affected jurisdictions. These locations include intersections in areas that would be most directly affected—such as by a change in channelization or signal control—as well as those indirectly affected by a change in traffic volume caused by trips accessing the light rail system. The latter includes intersections surrounding transit stations with proposed increases in park-and-ride lot capacity and passenger pick-up/drop-off activity. In total, more than 108 intersections were analyzed for the three segments. A Synchro version 7.0 model was used to determine LOS at all of the signalized and unsignalized intersections, with the exception of intersections at the NE 130th Street and NE 145th Street interchanges between 1st Avenue NE and 5th Avenue NE, and intersections in the Lynnwood City Center. VISSIM version 5.40 was used to analyze these intersections because it better captures the queue interactions between intersections. The LOS at signalized intersections is defined in terms of average delay per vehicle, based on the definitions described in the 2000 *Highway Capacity Manual*. These definitions are shown in Table 4-17 in Section 4.4, Arterials and Local Streets, of Chapter 4, Affected Environment. Detailed LOS analysis reports for each intersection are provided in Appendix C.

In most cases, the signal timing plans provided by the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood were used to analyze the No Build Alternative and the light rail alternatives for forecast year 2035. Where appropriate, minor changes were made to the existing signal timing and phasing plans to model the future conditions. Figures 5-20 through 5-23 summarize the PM and AM peak hour intersection LOS analysis results for the No Build Alternative (in forecast year 2035), and indicate where the light rail alternatives would cause LOS to degrade below standards if not effectively mitigated. Several intersections analyzed within the Shoreline city limits are not subject to the City's LOS standard. In these cases, LOS D was still used as a threshold for identifying potential congestion issues.

In most locations, intersections near proposed stations are expected to operate at an LOS similar to the No Build Alternative. Exceptions are shown in Figures 5-20 through 5-23. For the NE 130th and NE 145th Street areas, Synchro analysis results were supplemented by results from the VISSIM model that was used to assess freeway and interchange area operations for these two locations. Impacts specific to each segment and alternative are described in the following subsections. Potential measures for mitigating these impacts are described in Section 9.4, Arterials and Local Streets, in Chapter 9, Potential Mitigation Measures.



Intersection Level of Service
 Seattle, Shoreline & WSDOT HSS¹
 ● A-C
 ● D
 ● E-F

WSDOT non-HSS¹
 ● A-D
 ● E
 ● F

¹HSS = Highways of Statewide Significance

Project LOS
 (If different from No Build)
 ● Alt(s)

PA Preferred Alternative
 PA+ Preferred Alternative with Options

● * Intersection exceeds agency LOS standard with No Build Alternative and Project Alternative(s) increase delay.

Intersection Type
 ○ Signalized
 □ Two-Way Stop Controlled
 □^A All-Way Stop Controlled

Figure 5-21.
 Segments B and C
 Shoreline to Lynnwood
 2035 PM Peak Hour
 Intersection LOS

Lynnwood Link Extension

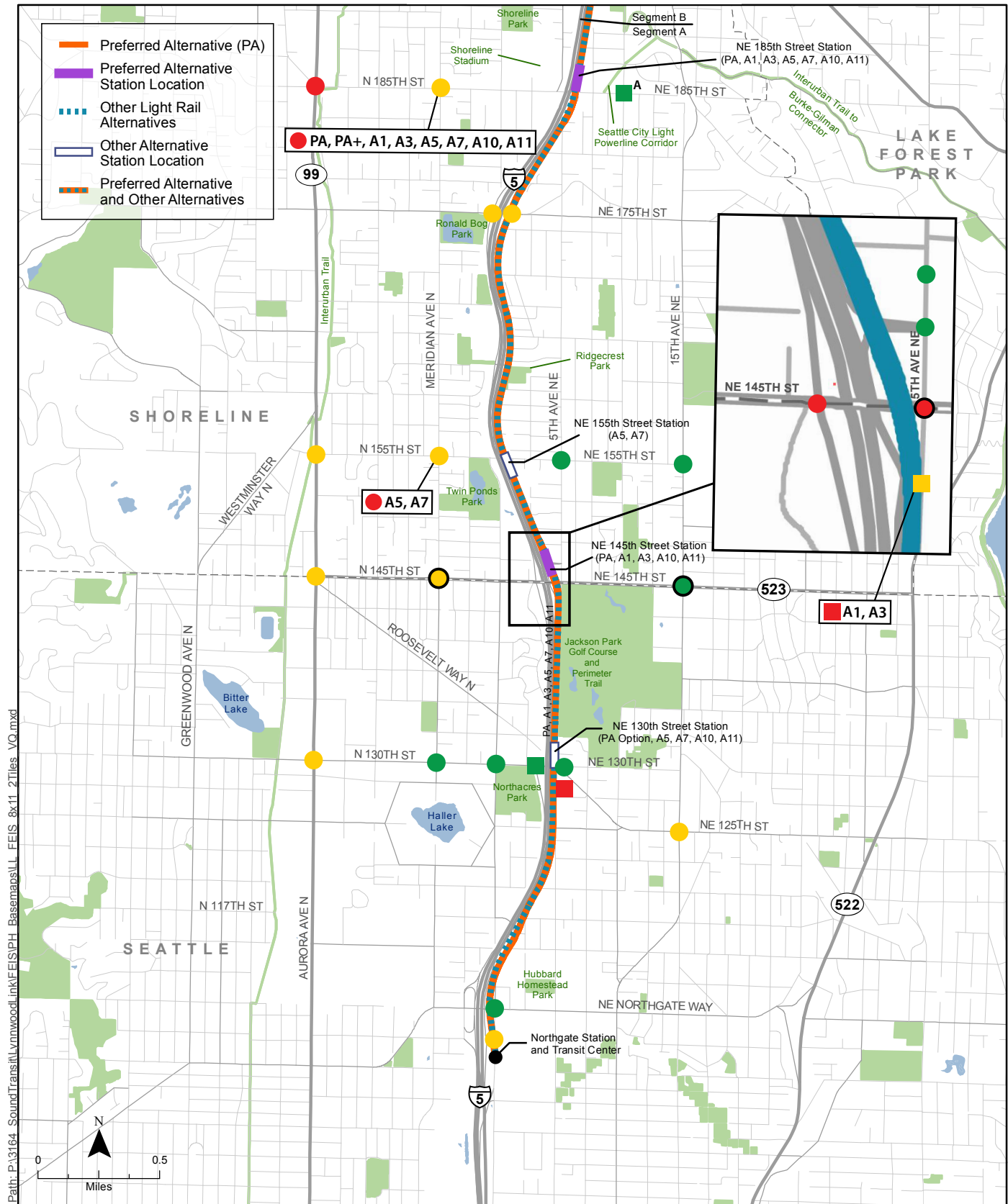


Figure 5-22.
Segment A Seattle
to Shoreline 2035
AM Peak Hour
Intersection LOS

PA Preferred Alternative
PA+ Preferred Alternative with Options

* Intersection exceeds agency LOS standard with No Build Alternative and Project Alternative(s) increase delay.

Lynnwood Link Extension

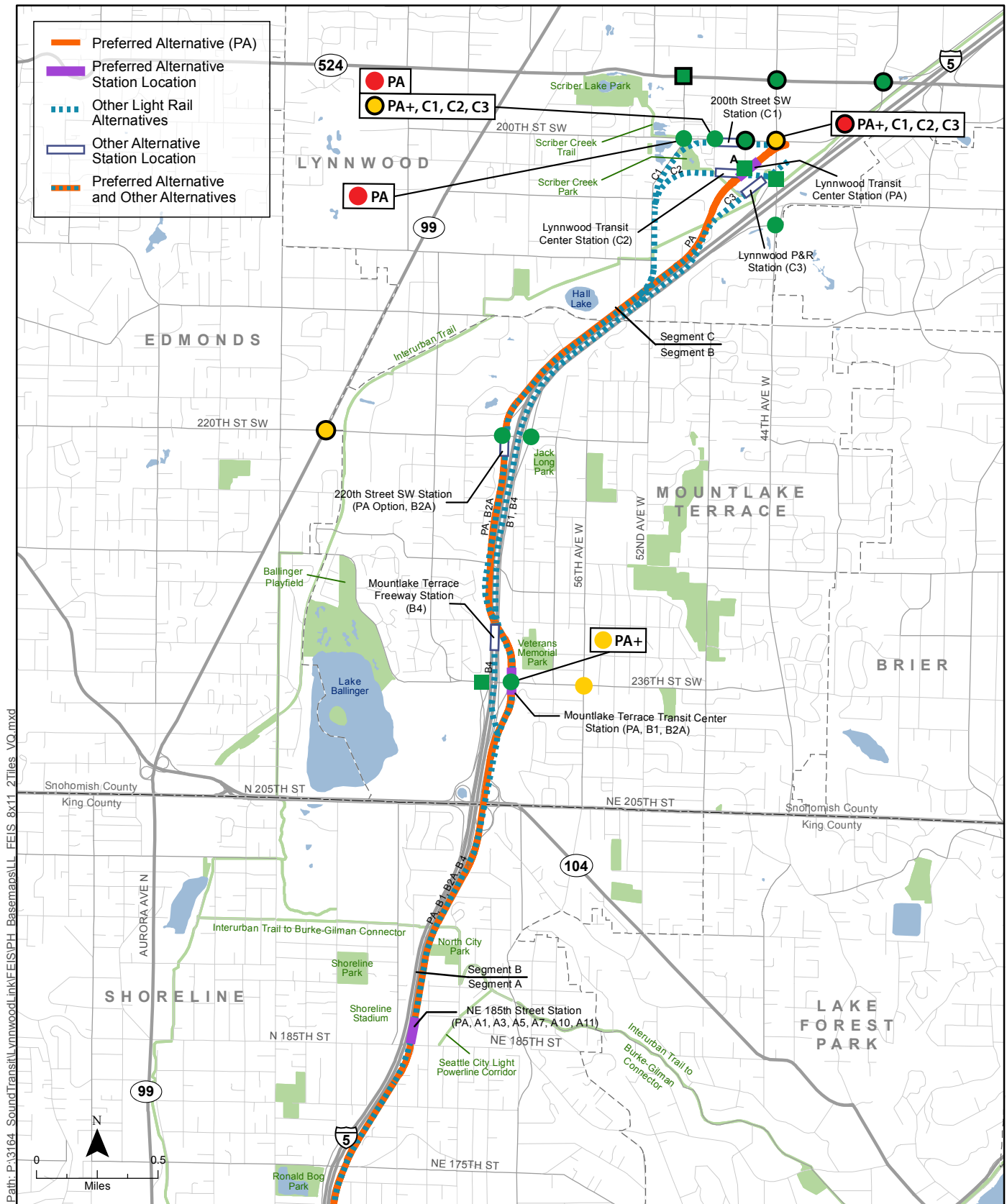


Figure 5-23.
Segments B and C
Shoreline to Lynnwood
2035 AM Peak Hour
Intersection LOS

Lynnwood Link Extension

Intersection Level of Service

Seattle, Shoreline & WSDOT HSS ¹	WSDOT non-HSS ¹
● A-C	● A-D
● D	● E
● E-F	● F

¹HSS = Highways of Statewide Significance

Project LOS (If different from No Build LOS)



PA Preferred Alternative
PA+ Preferred Alternative with Options

■ * Intersection exceeds agency LOS standard with No Build Alternative and Project Alternative(s) increase delay.

Intersection Type

○	Signalized
□	Two-Way Stop Controlled
□^A	All-Way Stop Controlled

Segment A: Seattle to Shoreline

Tables 5-26 and 5-27 show the PM and AM peak hour LOS results for the Segment A No Build Alternative and the light rail alternatives in forecast year 2035. As shown in Table 5-26, 17 of the 67 intersections evaluated in Segment A would operate below LOS standards with the No Build Alternative during the PM peak hour. An additional two intersections would degrade below LOS standards during the PM peak hour with the Preferred Alternative, and between three and seven intersections would degrade with the other light rail alternatives. For the AM peak hour (Table 5-27), four intersections would operate below LOS standards with the No Build Alternative. One additional intersection would degrade below LOS standards during the AM peak hour with Alternatives A1 and A3 (5th Avenue NE and I-5 Northbound Off-ramp).

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
NE 130th Street Station										
North 130th Street and Aurora Avenue North	D	E	E	E	E	*	E	E	E	E
North 130th Street and Meridian Avenue North	D	B	B	B	B	*	B	B	B	B
North 130th Street and Corliss Avenue North	D	B	B	B	B	*	B	B	B	B
North 130th Street and 1st Avenue North	D	C	C	C	C	*	C	C	C	C
NE 130th Street and I-5 southbound on-ramp	D	A	A	A	A	*	A	A	A	A
5th Avenue NE and park-and-ride driveway (north)	D	*	*	*	*	*	*	A	*	A
5th Avenue NE and park-and-ride driveway (south)	D	*	*	*	*	*	*	A	*	A
5th Avenue NE and Park-and-Ride Driveway (church)	D	*	*	A	*	*	A	*	*	*
NE 130th Street and 5th Avenue NE	D	C	C	C	C	*	C	C	C	C
5th Avenue NE and I-5 northbound off-ramp	D	F	*	*	*	*	*	F	*	F
5th Avenue NE and NE 127th Street	D	C	B	B	B	*	B	B	B	B
5th Avenue NE and NE 125th Street	D	C	C	C	C	*	C	C	C	C
Roosevelt Way NE and 8th Avenue NE	D	D	D	D	D	*	D	D	D	D

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
8th Avenue NE and NE 127th Street	D	A	A	A	A	*	A	A	A	A
Roosevelt Way NE and 10th Avenue NE	D	B	B	B	B	*	B	B	B	B
NE 125th Street and 15th Avenue NE	D	E	E	E	E	*	E	E	E	E
NE 145th/NE 155th Street Station										
North 145th Street and Aurora Avenue North	D	E	E	E	E	E	*	*	E	E
North 145th Street and Meridian Avenue North	E	B	C	C	C	C	*	*	C	C
North 145th Street and Corliss Avenue North	E	D	D	D	D	D	*	*	D	D
North 145th Street and 1st Avenue NE	E	D	D	F	F	F	*	*	F	F
NE 145th Street and 3rd Avenue NE	E	F	F	F	F	F	*	*	F	F
NE 145th Street and I-5 southbound ramps	D	C	C	D	D	D	*	*	D	D
5th Avenue NE and park-and-ride driveway	D	A	A	A	B	B	*	*	C	B
5th Avenue NE and I-5 northbound on-ramp	D	B	B	A	A	A	*	*	A	A
NE 145th Street and 5th Avenue NE	E	D	D	E	F	F	*	*	E	E
5th Avenue NE and I-5 northbound off-ramp	D	F	F	F	F	F	*	*	F	F

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
NE 145th Street and 6th Avenue NE	E	E/F	E/F	E/F	E/F	E/F	*	*	E/F	E/F
NE 145th Street and 8th Avenue NE	E	D	D	D	D	D	*	*	D	D
NE 145th Street and 10th Avenue NE	E	F	F	F	F	F	*	*	F	F
NE 145th Street and 12th Avenue NE	E	F	F	F	F	F	*	*	F	F
NE 145th Street and 15th Avenue NE	E	E	E	E	E	E	*	*	E	E
NE 145th Street and Lake City Way NE	D	F	F	F	F	F	*	*	F	F
North 155th Street and Aurora Avenue North	D	E	*	*	*	*	E	E	*	*
North 155th Street and Ashworth Avenue North	D	C	*	*	*	*	D	D	*	*
North 155th Street and Meridian Avenue North	D	D	*	*	*	*	E	E	*	*
North 155th Street and Corliss Avenue North	D	C	*	*	*	*	C	C	*	*
North 155th Street and 1st Avenue NE	D	F	*	*	*	*	F	F	*	*
NE 155th Street and park-and-ride driveway	D	*	*	*	*	*	C	C	*	*
NE 155th Street and 3rd Avenue NE	D	B	*	*	*	*	C	C	*	*
NE 155th Street and 4th Avenue NE	D	B	*	*	*	*	C	C	*	*
NE 155th Street and 5th Avenue NE	D	B	*	*	*	*	B	B	*	*

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
NE 155th Street and 6th Avenue NE	D	C	*	*	*	*	D	D	*	*
NE 155th Street and 8th Avenue NE	D	E	*	*	*	*	F	F	*	*
NE 155th Street and 10th Avenue NE	D	D	*	*	*	*	D	D	*	*
NE 155th Street and 12th Avenue NE	D	C	*	*	*	*	D	D	*	*
NE 155th Street and 15th Avenue NE	D	E	*	*	*	*	F	F	*	*
NE 159th Street and 1st Avenue NE	D	A	*	*	*	*	A	A	*	*
NE 161st Street and 1st Avenue NE	D	A	*	*	*	*	A	A	*	*
NE 165th Street and 5th Avenue NE	D	F	*	*	*	*	F	F	*	*
NE 185th Street Station										
North 185th Street and SR 99	D	E	E	E	E	E	E	E	E	E
North 185th Street and Meridian Avenue North	D	D	E	E	E	E	E	E	E	E
North 185th Street and Corliss Avenue North	D	B	B	B	B	B	B	B	B	B
North 185th Street and 1st Avenue NE	D	C	C	C	C	C	C	C	C	C
NE 185th Street and 2nd Avenue NE	D	C	E	E	E	E	E	E	E	E
NE 185th Street and 3rd Avenue NE	D	C	D	D	D	D	C	D	C	D

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
5th Avenue NE and park-and-ride driveway	D	*	B	B	B	*	*	*	*	*
NE 185th Street and 5th Avenue NE	D	C	C	C	C	C	D	C	D	C
NE 185th Street and 7th Avenue NE	D	D	A	A	D	D	F	D	F	D
8th Avenue NE and transit center driveway (in)	D	*	A	A	A	A	A	A	A	A
8th Avenue NE and park-and-ride driveway (north)	D	*	*	*	*	A	A	A	A	A
8th Avenue NE and park-and-ride driveway (south) / transit center driveway (out)	D	*	*	*	*	A	B	A	B	A
NE 185th Street and 8th Avenue NE	D	C	C	C	C	E	D	E	D	E
NE 185th Street and east park-and-ride driveway (south)	D	*	*	*	*	*	B	*	B	*
NE 185th Street and 9th Avenue NE	D	B	B	B	B	B	B	B	B	B
10th Avenue NE and east park-and-ride driveway (north)	D	*	*	*	*	*	A	*	A	*
NE 185th Street and 10th Avenue NE	D	C	C	C	C	C	C	C	C	C
NE Perkins Way and 15th Avenue NE	D	C	C	C	C	C	C	C	C	C
North 180th Street and Meridian Avenue North	D	D	D	D	D	D	D	D	D	D

Table 5-26. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
NE 180th Street and 5th Avenue NE	D	B	B	B	B	B	B	B	B	B
NE 180th Street and 10th Avenue NE	D	B	B	B	B	B	B	B	B	B
NE 180th Street and 15th Avenue NE	D	B	B	B	B	B	B	B	B	B
North 175th Street and SR 99	D	D	D	D	D	D	D	D	D	D
North 175th Street and Meridian Avenue North	D	E	E	E	E	E	E	E	E	E
NE 175th Street and I-5 southbound ramps	D	C	C	C	C	C	C	C	C	C
NE 175th Street and I-5 northbound ramps	D	E	E	E	E	E	E	E	E	E
NE 175th Street and 5th Avenue NE	D	B	B	B	B	B	B	B	B	B

Notes:

LOS results highlighted in **BOLD** and grey shading indicate intersection locations where LOS with the light rail alternatives, because they worsen conditions compared to the No Build Alternative, would degrade to levels that do not meet the jurisdiction's LOS standard and may require mitigation.

* Location not analyzed for specified alternative. Intersection would be expected to operate similar to No Build Alternative.

Table 5-27. Forecast Year 2035 AM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternativ e	Preferred with Option	A1	A3	A5	A7	A10	A11
NE 130th Street Station										
North 130th Street and Aurora Avenue North	D	D	D	D	D	*	D	D	D	D
North 130th Street and Meridian Avenue North	D	B	B	B	B	*	B	B	B	B
North 130th Street and 1st Avenue North	D	C	C	C	C	*	C	C	C	C
NE 130th Street and I-5 southbound on-ramp	D	A	A	A	A	*	A	A	A	A
5th Avenue NE and park-and-ride driveway (north)	D	*	*	*	*	*	*	A	*	A
5th Avenue NE and park-and-ride driveway (south)	D	*	*	*	*	*	*	A	*	A
5th Avenue NE and Park-and-Ride Driveway (church)	D	*	*	A	*	*	A	*	*	*
NE 130th Street and 5th Avenue NE	D	C	C	C	C	*	C	C	C	C
5th Avenue NE and I-5 northbound off-ramp	D	E	*	*	*	*	*	E	*	E
NE 125th Street and 15th Avenue NE	D	D	D	D	D	*	D	D	D	D
NE 145th/NE 155th Street Station										
North 145th Street and Aurora Avenue North	D	D	D	D	D	D	*	*	D	D
North 145th Street and Meridian Avenue North	E	E	E	E	E	E	*	*	E	E
NE 145th Street and I-5 southbound ramps	D	F	E	F	F	F	*	*	F	F
5th Avenue NE and park-and-ride driveway	D	A	B	B	B	B	*	*	B	B
5th Avenue NE and I-5 northbound on-ramp	D	B	C	A	C	A	*	*	C	A

Table 5-27. Forecast Year 2035 AM Peak Hour Intersection LOS—Segment A

Nearest Station/ Intersection	LOS Std.	Alternative								
		No Build	Preferred Alternativ e	Preferred with Option	A1	A3	A5	A7	A10	A11
NE 145th Street and 5th Avenue NE	E	F	F	F	F	F	*	*	F	F
5th Avenue NE and I-5 northbound off-ramp	D	D	D	D	E	E	*	*	D	D
NE 145th Street and 15th Avenue NE	E	D	D	D	D	D	*	*	D	D
North 155th Street and Aurora Avenue North	D	D	*	*	*	*	D	D	*	*
North 155th Street and Meridian Avenue North	D	D	*	*	*	*	E	E	*	*
NE 155th Street and 5th Avenue NE	D	B	*	*	*	*	B	B	*	*
NE 155th Street and 15th Avenue NE	D	B	*	*	*	*	C	C	*	*
NE 185th Street Station										
North 185th Street and SR 99	D	F	F	F	F	F	F	F	F	F
North 185th Street and Meridian Avenue North	D	D	E	E	E	E	E	E	E	E
NE 185th Street and 10th Avenue NE	D	A	B	B	B	B	B	B	B	B
NE 175th Street and I-5 southbound ramps	D	D	D	D	D	D	D	D	D	D
NE 175th Street and I-5 northbound ramps	D	D	D	D	D	D	D	D	D	D

Notes:

LOS results highlighted in **BOLD** and grey shading indicate intersection locations where LOS with the light rail alternatives, because they worsen conditions compared to the No Build Alternative, would degrade to levels that do not meet the jurisdiction's LOS standard and may require mitigation.

* Location not analyzed for specified alternative. Intersection would be expected to operate similar to No Build Alternative.

City of Shoreline Arterial LOS

For Shoreline, the following arterials were also evaluated for v/c ratios to ensure consistency with City concurrency standards:

- NE 155th Street—Westminster Way North to 15th Avenue NE
- NE 185th Street—Aurora Avenue North to 10th Avenue NE
- 5th Avenue NE/7th Avenue NE—NE 145th Street to NE 185th Street
- Meridian Avenue North—North 145th Street to North 205th Street
- 15th Avenue NE—NE 145th Street to NE 205th Street
- NE 175th Street—Aurora Avenue North to 15th Avenue NE

The v/c ratios for these arterials, shown in Figure 5-24 for the No Build Alternative, were compared with the City's v/c standard of 0.90 or lower for most principal and minor arterials. Figure 5-25 shows additional locations where the light rail alternatives would cause v/c ratios to degrade below 0.90.

As shown in Figures 5-24 and 5-25, the following arterial segments would not meet the City of Shoreline's concurrency standards during the PM peak hour in 2035 with the No Build Alternative:

- Meridian Avenue North from North 155th Street to North 185th Street—northbound
- 5th Avenue NE from north of North 145th Street to NE 165th Street—northbound
- 15th Avenue NE south of and north of NE 155th Street—northbound (v/c ratio greater than 1.10, exceeds LOS standard)
- NE 175th Street west of 15th Avenue NE—westbound
- NE 185th Street west of 1st Avenue NE—eastbound
- NE 185th Street east of 1st Avenue NE—westbound

In addition, the following additional arterial segments would degrade to levels below the City of Shoreline's concurrency standards during the PM peak hour:

- NE 185th Street east of Meridian Avenue NE—westbound (all Segment A alternatives)
- NE 185th Street from 2nd Avenue NE to 5th Avenue NE—westbound (all Segment A alternatives)



Figure 5-24. Forecast Year 2035 PM Peak Arterial LOS for the No Build Alternative—City of Shoreline Arterials



Figure 5-25. City of Shoreline Arterials Worsened by the Light Rail Alternatives

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

With the Preferred Alternative, the following three intersections may require mitigation due to degraded operations below LOS standards compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- NE 145th Street and 6th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*

In addition, the following intersection already exceeds the LOS standard in the No Build Alternative, and would experience increased delay with the Preferred Alternative:

- NE 145th Street and 12th Avenue NE

NE 145th Street Station

With the NE 145th Street Station for the Preferred Alternative, the I-5 northbound on-ramp would be moved to the north and signalized. Vehicles exiting the park-and-ride would exit at the relocated northbound on-ramp signalized intersection. Vehicles would enter the 500-space park-and-ride at a new unsignalized entrance along 5th Avenue NE midway between the northbound ramp intersection and the intersection with 145th Street NE.

During the PM peak hour new vehicle trips in the station vicinity would cause LOS at the intersection of NE 145th Street and 6th Avenue NE to degrade to LOS F.

In addition, PM peak-hour intersection delay would increase at the intersection of NE 145th Street and 12th Avenue NE. This location, however, would already operate at LOS F during the PM peak hour with the No Build Alternative.

NE 185th Street Station

With the NE 185th Street Station Option 1 for the Preferred Alternative, vehicles would access the 500-space park-and-ride via a new stop-controlled intersection on 5th Avenue NE north of NE 185th Street. It is assumed that most of the traffic accessing the park-and-ride would turn to or from NE 185th Street, and that left-turning vehicles would use the center two-way left-turn lane assumed to be included in the No Build Alternative.

A southbound right-turn pocket would be provided at the intersection of NE 185th Street and 5th Avenue NE. In addition, the two-way left-turn lane on NE 185th Street at 5th Avenue NE assumed in the No Build Alternative was also assumed to

extend east to the intersection of NE 185th Street and 7th Avenue NE and would facilitate traffic movements to/from the transit center driveway.

New vehicle trips in the station vicinity is expected to cause LOS at the intersections of North 185th Street and Meridian Avenue North, and North 185th Street and 2nd Avenue NE to degrade to LOS E during the PM peak hour. The North 185th Street and Meridian Avenue North intersection is also projected to degrade to LOS E during the AM peak hour.

Preferred Alternative with Options: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

With the Preferred Alternative with options, the following four intersections may require mitigation due to degraded operations below LOS standards compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- North 145th Street and 1st Avenue NE
- NE 145th Street and 6th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*

In addition, the following intersection already exceeds the LOS standard in the No Build Alternative, and would experience increased delay with the Preferred Alternative with options:

- NE 145th Street and 12th Avenue NE

NE 130th Street Station

With the NE 130th Street Station Option 1 for the Preferred Alternative with options, vehicles would access the 100-space park-and-ride via a new stop-controlled intersection on 5th Avenue NE north of NE 130th Street. The I-5 northbound off-ramp would be relocated to the south and southbound 5th Avenue NE would be moved below the off-ramp.

NE 145th Street Station

With the NE 145th Street Station Option 2 for the Preferred Alternative, the I-5 northbound on-ramp would be moved to the north and signalized. Vehicles would access the 500-space park-and-ride at a new stop-controlled intersection to 5th Avenue NE midway between the northbound ramp intersection and the intersection with 145th Street NE.

During the PM peak hour new vehicle trips in the station vicinity would cause LOS at the intersections of NE 145th Street and 1st Avenue NE, and NE 145th Street and 6th Avenue NE to degrade to LOS F.

In addition, PM peak-hour intersection delay would increase at the intersection of NE 145th Street and 12th Avenue NE. This location, however, would already operate at LOS F during the PM peak hour with the No Build Alternative.

NE 185th Street Station

The Preferred Alternative with options would result in the same LOS as the Preferred Alternative with the NE 185th Street Station.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

With Alternative A1, the impacts would be the same as with the Preferred Alternative for the NE 130th Street and NE 185th Street Stations.

NE 130th Street Station

Alternative A1 would result in the same LOS as the Preferred Alternative with the NE 130th Street Station.

NE 145th Street Station

With Alternative A1, the following four intersections at NE 145th Street Station may require mitigation due to degraded operations below LOS standards compared to the No Build Alternative:

- NE 145th Street and 1st Avenue NE
- NE 145th Street and 5th Avenue NE
- NE 145th Street and 6th Avenue NE
- 5th Avenue NE and I-5 Northbound Off-Ramp (south of NE 145th Street)

In addition, the following intersection already exceeds the LOS standard in the No Build Alternative, and would experience increased delay with the Alternative 1:

- NE 145th Street and 12th Avenue NE

With the NE 145th Street Station Option 2 for the Alternative A1, the I-5 northbound on-ramp would be moved to the north and signalized. Vehicles would access the 500-space park-and-ride at a new stop-controlled intersection to 5th Avenue NE midway between the northbound ramp intersection and the intersection with 145th Street NE.

During the PM peak hour new vehicle trips in the station vicinity would cause LOS at the intersections of NE 145th Street and 1st Avenue NE, NE 145th Street and 5th Avenue NE, and NE 145th Street and 6th Avenue NE to degrade to LOS F. During the AM peak hour the 5th Avenue NE and I-5 northbound off-ramp would degrade to LOS E.

In addition, PM peak-hour intersection delay would increase at the intersection of NE 145th Street and 12th Avenue NE. This location, however, would already operate at LOS F during the PM peak hour with the No Build Alternative.

NE 185th Street Station

Alternative A1 would result in the same LOS as the Preferred Alternative with the NE 185th Street Station.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

With Alternative A3, the following six intersections may require mitigation due to degraded operations below LOS standards compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- NE 145th Street and 1st Avenue NE
- NE 145th Street and 5th Avenue NE
- 5th Avenue NE and I-5 northbound off-ramp (south of NE 145th Street)
- NE 145th Street and 6th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*

In addition, the following intersection already exceeds the LOS standard in the No Build Alternative, and would experience increased delays with Alternative A3:

- NE 145th Street and 12th Avenue NE

NE 145th Street Station

Alternative A3 would result in the same LOS as Alternative A1 with the NE 145th Street Station.

NE 185th Street Station

With the NE 185th Street Station Option 2 for Alternative A3, vehicles would access the 500-space park-and-ride via a new stop-controlled intersection on 8th Avenue NE north of NE 185th Street.

During the PM peak hour new vehicle trips in the station vicinity would cause LOS at the intersections of North 185th Street and Meridian Avenue North, and NE 185th Street and 2nd Avenue NE to degrade to LOS E. During the AM peak hour the North 185th Street and Meridian Avenue North intersection would also degrade to LOS E.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

With Alternative A5, the following six intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- North 155th Street and Meridian Avenue North
- NE 155th Street and 8th Avenue NE
- NE 155th Street and 15th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*
- NE 185th Street and 7th Avenue NE*

In addition, the following two intersections already exceed LOS standards in the No Build Alternative, and would experience increased delays with Alternative A5:

- North 155th Street and 1st Avenue NE
- NE 165th Street and 5th Avenue NE

NE 130th Street Station

Alternative A5 would result in the same LOS as the Preferred Alternative with options with the NE 130th Street Station.

NE 155th Street Station

With the NE 155th Street Station for Alternative A5, vehicles would access the 500-space park-and-ride via a new south leg at the 155th Street NE and 3rd Avenue NE intersection.

During the PM peak hour, new vehicle trips in the station vicinity would cause LOS at the intersections of North 155th Street and Meridian Avenue North, NE 155th Street and 8th Avenue NE, and NE 155th Street and 15th Avenue NE to degrade to LOS E, F, and F, respectively.

During the AM peak hour, the 155th Street and Meridian Avenue North intersection would also degrade to LOS F.

In addition, PM peak hour intersection delays would increase at the NE 155th Street and 1st Avenue NE, and 165th Street and 5th Avenue NE intersections. These locations already operate at LOS F during the PM peak hour with the No Build Alternative.

NE 185th Street Station

With the NE 185th Street Station Option 3 for Alternative A5, vehicles would access a 150-space park-and-ride via a new stop-controlled intersection on 8th Avenue NE north of NE 185th Street, and a 200-space park-and-ride via new unsignalized intersections on 10th Avenue NE north of NE 185th Street and NE 155th Street west of 10th Avenue NE.

During the PM peak hour new vehicle trips in the station vicinity would cause LOS to degrade to LOS E at the intersection of North 185th Street and Meridian Avenue North, and NE 185th Street and 2nd Avenue NE, and to LOS F at the NE 185th Street and 7th Avenue NE intersection. The North 185th Street and Meridian Avenue North intersection would also degrade to LOS E during the AM peak hour.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

With Alternative A7, the following six intersections may require mitigation due to degraded operations below LOS standards compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- North 155th Street and Meridian Avenue North
- NE 155th Street and 8th Avenue NE
- NE 155th Street and 15th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*
- NE 185th Street and 8th Avenue NE*

In addition, the following two intersections already exceed LOS standards in the No Build Alternative, and experience increased delays with Alternative A7:

- North 155th Street and 1st Avenue NE
- NE 165th Street and 5th Avenue NE

NE 130th Street Station

With the NE 130th Street Station Option 2 for Alternative A7, vehicles would access the 100-space park-and-ride via two new stop-controlled intersections on 5th Avenue NE north of NE 130th Street.

NE 155th Street Station

Alternative A7 would result in the same LOS as Alternative A5 with the NE 155th Street Station.

NE 185th Street Station

Alternative A7 would result in the same LOS as Alternative A3 with NE 185th Street Station Option 2.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

With Alternative A10, the following four intersections may require mitigation due to degraded operations below standards (LOS E to F) compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- North 145th Street and 1st Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*
- NE 185th Street and 7th Avenue NE

In addition, the following intersection already exceeds LOS standards in the No Build Alternative, and experience increased delays with Alternative A10:

- NE 145th Street and 12th Avenue NE

NE 130th Street Station

Alternative A10 would result in the same LOS as the Preferred Alternative with the NE 130th Street Station.

NE 145th Street Station

With the NE 145th Street Station Option 1 for Alternative A10, vehicles would access the 650-space park-and-ride at a new signalized intersection north of the I-5 northbound on-ramp.

New vehicle trips in the station vicinity would cause LOS at the intersections of North 145th Street and 1st Avenue NE to degrade to LOS F during the PM peak hour.

In addition, PM peak hour intersection delays would increase at the NE 145th Street and 12th Avenue NE intersection. This location already operate at LOS F during the PM peak hour with the No Build Alternative.

NE 185th Street Station

Alternative A10 would result in the same LOS as Alternative A5 with NE 185th Street Station Option 3.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

With Alternative A11, the following five intersections may require mitigation due to degraded operations below LOS standards (LOS E to F) compared to the No Build Alternative (intersections marked with an asterisk [*] are not subject to the City of Shoreline's LOS D standard):

- North 145th Street and 1st Avenue NE
- NE 145th Street and 6th Avenue NE
- North 185th Street and Meridian Avenue North
- NE 185th Street and 2nd Avenue NE*
- NE 185th Street and 8th Avenue NE*

In addition, the following two intersections already exceed LOS standards in the No Build Alternative and experience increased delays with Alternative A11:

- NE 145th Street and 12th Avenue NE

NE 130th Street Station

Alternative A11 would result in the same LOS as Alternative A7 with NE 130th Street Station Option 2.

NE 145th Street Station

Alternative A11 would result in the same LOS as Alternative A1 with NE 145th Street Station Option 2.

NE 185th Street Station

Alternative A11 would result in the same LOS as Alternative A3 with NE 185th Street Station Option 2.

Segment B: Shoreline to Mountlake Terrace

Tables 5-28 and 5-29 show the PM and AM peak hour LOS results for the No Build Alternative and light rail alternatives in Segment B for forecast year 2035. As shown in Table 5-28, the intersection of 220th Street SW and SR 99 would operate below LOS standards in the PM peak hour with both the No Build Alternative and light rail alternatives. All other intersections would operate within LOS standards during the PM and AM peak hours.

Table 5-28. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment B

Nearest Station/ Intersection	LOS	Alternative					
		No Build	Preferred Alternative	Preferred Alternative with Option	B1	B2A	B4
Mountlake Terrace Station							
Lakeview Drive and 65th Place West	E	B	C	C	C	C	C
Lakeview Drive and 64th Avenue West	E	B	B	B	B	B	B
236th Street SW and I-5 southbound collector-distributor on-ramp	D	A	A	A	A	A	A
236th Street SW and I-5 northbound off-ramp	D	C	C	C	C	C	C
236th Street SW and transit center driveway (out)	E	*	D	D	D	D	*
236th Street SW and 58th Avenue West	E	A	B	B	B	B	B
236th Street SW and 56th Avenue West	D	D	D	D	D	D	D
220th Street SW Station							
220th Street SW and SR 99	E	F	F	F	F	F	*
220th Street SW and 70th Avenue West	E	C	*	C	*	*	*
220th Street and 66th Avenue West	E	D	*	D	*	*	*
220th Street and 64th Avenue West	E	C	*	C	*	*	*
64th Avenue West and 222nd Street SW	E	A	*	A	*	*	A
220th Street SW and park-and-ride driveway	E	*	*	A	*	*	A
220th Street SW and I-5 southbound ramps	D	B	*	B	*	*	B
220th Street SW and I-5 northbound ramps	D	C	*	C	*	*	C

Table 5-28. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment B

Nearest Station/ Intersection	LOS	Alternative					
		No Build	Preferred Alternative	Preferred Alternative with Option	B1	B2A	B4
220th street SW and 58th Avenue West	E	A	*	A	*	*	A
220th Street SW and 56th Avenue West	E	C	*	C	*	*	C
220th Street SW and 55th Avenue West	E	B	*	B	*	*	B
220th Street SW and 54th Avenue West	E	B	*	B	*	*	B
220th Street SW and 53rd Avenue West	E	B	*	B	*	*	B
220th Street SW and 52nd Avenue West	E	C	*	C	*	*	C

Notes:

* Location not analyzed for specified alternative. Intersection would be expected to operate similar to No Build Alternative.

Table 5-29. Forecast Year 2035 AM Peak Hour Intersection LOS—Segment B

Nearest Station/ Intersection	LOS	No Build	Preferred Alternative	Alternative			
				Preferred Alternative with Option	B1	B2A	B4
Mountlake Terrace Station							
236th Street SW and I-5 southbound collector- distributor on-ramp	D	A	B	B	B	B	B
236th Street SW and I-5 northbound off-ramp	D	C	C	D	C	C	C
236th Street SW and transit center driveway (out)	E	*	D	D	D	D	*
236th Street SW and 56th Avenue West	D	D	D	D	D	D	D
220th Street SW Station							
220th Street SW and SR 99	E	E	*	E	*	E	*
220th Street SW and I-5 southbound ramps	D	B	*	C	*	C	*
220th Street SW and I-5 northbound ramps	D	C	*	C	*	C	*

Notes:

* Location not analyzed for specified alternative. Intersection would be expected to operate similar to No Build Alternative

Preferred Alternative: East Side to Mountlake Terrace Transit Center to West Side

With the Preferred Alternative, no intersections would require mitigation due to degraded operations below standards and/or increased delays compared with the No Build Alternative.

Mountlake Terrace Transit Center Station

With the Preferred Alternative, all intersections evaluated near the Mountlake Terrace Transit Center Station would operate at LOS standards similar to the No Build Alternative. The proposed park-and-ride driveway at 236th Street SW and 58th Avenue West would operate at LOS D during both the PM and AM peak hours with a two-way left-turn lane on 58th Avenue West.

Preferred Alternative with Options: East Side to Mountlake Terrace Transit Center to West Side

With the Preferred Alternative, no intersections would require mitigation due to degraded operations below standards and/or increased delays compared with the No Build Alternative.

Mountlake Terrace Transit Center Station

The Mountlake Terrace Transit Center Station would operate similar to the Preferred Alternative.

220th Street Station

With the Preferred Alternative with options, all intersections evaluated near the 220th Street Station would operate at LOS standards similar to the No Build Alternative.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

With Alternative B1, no intersections would require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative.

Mountlake Terrace Transit Center Station

Alternative B1 would result in the same LOS as the Preferred Alternative.

Alternative B2A: Optional 220th Street SW Station (elevated)**Mountlake Terrace Transit Center Station**

Alternative B2A would result in the same LOS as the Preferred Alternative.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

With Alternative B4, no intersections would require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative.

Mountlake Terrace Freeway Station

With Alternative B4, vehicle trips and local access near the Mountlake Terrace Freeway Station are expected to be the same as with the Mountlake Terrace Transit Center (Alternatives B1 and B2A). Therefore, Alternative B4 would also result in the same intersection LOS as the Preferred Alternative.

Segment C: Mountlake Terrace to Lynnwood

Tables 5-30 and 5-31 show the PM and AM peak hour LOS results for the No Build Alternative and light rail alternatives (forecast year 2035) in Segment C. As shown in Table 5-30, five out of the 22 intersections evaluated in Segment C would operate below LOS standards with the No Build Alternative during the PM peak hour. With the Preferred Alternative and other light rail alternatives, most of these intersections would operate with delays similar to the No Build Alternative. The two exceptions are the intersections at 200th Street SW and 48th Avenue West, and 52nd Avenue West and 204th Street SW, which would have higher delays than the No Build Alternative with all of the alternatives. In the Final EIS, an option is being reviewed for the Preferred Alternative to have an additional 400 park-and-ride parking spaces at the station, which would cause an additional intersection, 200th Street SW and 50th Avenue West, to fall below operating standards in comparison to the No Build Alternative. This is due to the increased vehicle trips attached to the additional parking stalls. For the AM peak hour (Table 5-31), none of the intersections would operate below LOS standards with the No Build Alternative, but two intersections (200th Street SW/48th Avenue West and 200th Street SW/50th Avenue West) would degrade below LOS standards with the Preferred Alternative. For all other light rail alternatives, 200th Street SW and 44th Avenue West would degrade below LOS standards during the AM peak hour.

Table 5-30. Forecast Year 2035 PM Peak Hour Intersection LOS—Segment C

Nearest Station/ Intersection	LOS	No Build	Preferred	Alternative			
				Preferred with Option	C1	C2	C3
Lynnwood Station							
196th Street SW and 52nd Avenue West	E	C	C	C	C	C	C
196th Street SW and 50th Avenue West	E	F	F	F	F	F	F
196th Street SW and 48th Avenue West	E	E	E	E	E	E	E
196th Street SW and 44th Avenue West	E	F	F	F	F	F	F
196th Street SW and 40th Avenue West	E	E	E	E	E	E	E
196th Street SW and 36th Avenue West	D	F	E	E	E	E	E
196th Street SW and Poplar Way	E	D	C	D	D	D	D
Alderwood Mall Parkway/I-5 Northbound Ramps and Poplar Way	D	C	C	C	C	C	C
198th Street and 44th Avenue West	E	A	A	A	A	A	A
198th Street and 40th Avenue West	E	A	D	B	B	B	B
200th Street SW and 50th Avenue West	D	D	D	E	E	E	E
200th Street SW and 48th Avenue West	D	D	E	E	D	D	D
200th Street SW and 46th Avenue West	E	C	C	D	D	D	D
200th Street SW and 44th Avenue West	E	E	E	E	E	E	E
200th Street SW and 40th Avenue West	E	A	A	A	A	A	A
52nd Avenue West and 204th Street SW	E	E	F	F	F	F	F
52nd Avenue West and 208th Street SW	E	F	F	F	F	F	F
52nd Avenue West and 212th Street SW	E	F	F	F	F	F	F
46th Avenue West and garage driveway	E	C	C	E	E	E	E
44th Avenue West and I-5 southbound on-ramp	D	B	C	B	B	B	B
44th Avenue West and 204th Street SW	D	A	A	A	A	A	A
44th Avenue West and I-5 northbound off-ramp	D	C	C	C	C	C	C

Notes:

LOS results highlighted in **BOLD** and grey shading indicate intersection locations where LOS with the light rail alternatives, because they worsen conditions compared to the No Build Alternative, would degrade to levels that do not meet the jurisdiction's LOS standard and may require mitigation.

Table 5-31. Forecast Year 2035 AM Peak Hour Intersection LOS—Segment C

Nearest Station/ Intersection	LOS	Alternative					
		No Build	Preferred Alternative	Preferred Alternative with Option	C1	C2	C3
Lynnwood Station							
196th Street SW and 50th Avenue West	E	B	B	B	B	B	B
196th Street SW and 44th Avenue West	E	D	D	D	D	D	D
196th Street SW and 36th Avenue West	D	C	C	C	C	C	C
200th Street SW and 50th Avenue West	D	C	F	C	C	C	C
200th Street SW and 48th Avenue West	D	C	E	D	D	D	D
200th Street SW and 46th Avenue West	E	B	D	D	D	D	D
200th Street SW and 44th Avenue West	E	E	E	F	F	F	F
44th Avenue West and I-5 southbound on-ramp	D	B	A	A	A	A	A
44th Avenue West and I-5 northbound off-ramp	D	B	B	C	C	C	C

Notes:

LOS results highlighted in **BOLD** and grey shading indicate intersection locations where LOS with the light rail alternatives, because they worsen conditions compared to the No Build Alternative, would degrade to levels that do not meet the jurisdiction's LOS standard and may require mitigation.

Preferred Alternative: Along I-5 to Lynnwood Park-and-Ride Station

With the Preferred Alternative, the following three intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative:

- 200th Street SW and 50th Avenue West
- 200th Street SW and 48th Avenue West
- 204th Street SW and 52nd Avenue West

Park-and-Ride Station

With the preferred alternative, the main access would be off of 48th Avenue West. The access to the transit center and park-and-ride off of 46th Avenue West would be restricted to HOV and transit vehicles.

The intersections of 200th Street SW and 48th Avenue West, and 204th Street SW and 52nd Avenue West would degrade to LOS E and F, respectively, during the PM peak hour with the Preferred Alternative. During the AM peak hour, the intersections of 200th Street SW and 48th Avenue West and 200th Street SW and 50th Avenue West would degrade to LOS E and F, respectively.

Preferred Alternative with Options: Along I-5 to Lynnwood Park-and-Ride Station (plus 400 parking spaces)

With the Preferred Alternative with options, the following four intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative:

- 200th Street SW and 50th Avenue West
- 200th Street SW and 48th Avenue West
- 200th Street SW and 44th Avenue West
- 204th Street SW and 50th Avenue West

Park-and-Ride Station

The Preferred Alternative with options would operate similar to the Preferred Alternative, except the 200th Street SW and 48th Avenue West intersection would also degrade to LOS F during the PM peak hour.

Alternative C1: 52nd Avenue West to 200th Street SW

With Alternative C1, the following three intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative:

- 200th Street SW and 50th Avenue West
- 200th Street SW and 44th Avenue West
- 204th Street SW and 50th Avenue West

200th Street SW Station

The intersections of 200th Street SW and 50th Avenue West, and 204th Street SW and 50th Avenue West would degrade to LOS E and F, respectively, during the PM peak hour with Alternative C1. During the AM peak hour, the 200th Street SW and 44th Avenue West intersection would degrade to LOS F.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

With Alternative C2, the following three intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative:

- 200th Street SW and 50th Avenue West
- 200th Street SW and 44th Avenue West
- 204th Street SW and 50th Avenue West

Lynnwood Transit Center Station

Alternative C2 would result in the same LOS as Alternative C1.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

With Alternative C3, the following three intersections may require mitigation due to degraded operations below LOS standards and/or increased delays compared with the No Build Alternative:

- 200th Street SW and 50th Avenue West
- 200th Street SW and 44th Avenue West
- 204th Street SW and 50th Avenue West

Lynnwood Park-and-Ride Station

Alternative C3 would result in the same LOS as Alternative C1.

5.4.3 Property Access and Local Circulation

Implementation of light rail from Northgate to Lynnwood could affect property access and local circulation where roadway modifications are needed for guideway or station construction. The Preferred Alternative alignment includes some locations where changes would occur to property access and local circulation. The assessment of property access and local circulation with the light rail alternatives is based on review of the Preferred Alternative alignment and conceptual design of the light rail alignment and station alternatives.

Segment A: Seattle to Shoreline

Property access and local circulation would be affected in Segment A where alternatives would modify interchange ramp configurations, including modifications to NE 130th Street and NE 145th Street interchanges. An interchange justification report (IJR) is required for these modifications, with approval from WSDOT and FHWA. These potential impacts are discussed below by alternative.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

No change in property access or local circulation would result with the Preferred Alternative from the Northgate Station along 1st Avenue NE north of NE Northgate Way to North 117th Street. 1st Avenue NE would be reconstructed with the same access and connections as currently exist, including the trail connection to 3rd Avenue NE at NE 115th Street. The alternative would maintain and restore access to properties along the alignment that would remain, including construction of a new cul-de-sac access to the

Seattle Latvian Evangelical Lutheran Church from the intersection of 3rd Avenue NE at NE 117th Street.

The Preferred Alternative would include the reconstruction of the NE 130th Street interchange, which would result in changes to property access and local circulation on 5th Avenue NE. From NE 125th Street to NE 130th Street, properties along 5th Avenue NE will have right-turn access only to/from the driveways as well as at the NE 127th Street intersection. This would affect four properties on 5th Avenue NE north of NE 125th Street. The conceptual design for the interchange modifications would revise the intersection of 5th Avenue NE at NE 127th Street to right turns only. Access to and from NE 131st Place at 5th Avenue NE would be maintained, requiring a gap in the raised median. Access to and from the North Seattle Church of the Nazarene would be maintained, requiring a revised median for full access.

The reconstruction of the NE 130th Street overcrossing and interchange may require revisions at the intersection of NE 130th Street at Roosevelt Way NE located east of 5th Avenue NE, which could restrict turning movements from NE 130th Street to right turns only. NE 130th Street serves a residential neighborhood with 17 homes and provides additional access to 8th Avenue NE.

No changes in property access or local circulation are expected along 5th Avenue NE between NE 130th Street and NE 145th Street with the Preferred Alternative.

NE 145th Street Station

The Preferred Alternative would modify the location of the northbound on-ramp to I-5, which in turn would modify property access or local circulation for an estimated five parcels on the east side of 5th Avenue NE near the NE 145th Street Station. There is also some potential for cut-through traffic to access the station via local streets between 5th Avenue NE and 8th Avenue NE.

The Preferred Alternative would maintain access for properties on 3rd Avenue NE north of NE 151st Street.

North of NE 155th Street, the light rail guideway construction would include reconstruction of the local street—1st Avenue NE between NE 158th Street and NE 159th Street to maintain access and circulation. The Preferred Alternative would reconstruct 1st Avenue NE as a parking facility in conjunction with a water quality and infiltration facility between NE 159th Street and NE 161st Street, with connections to Ridgcrest Park. The Preferred Alternative would reconstruct 1st Avenue NE between NE 170th Street and NE 174th Street to maintain access and circulation.

The Preferred Alternative would maintain property access on 2nd Place NE and 3rd Avenue NE off of NE 178th Street.

NE 185th Street Station

The Preferred Alternative would reconstruct 5th Avenue NE north of NE 180th Street to maintain access to residences along the new roadway. 5th Avenue NE north of NE 185th Street would be rerouted to a new intersection, and property access would be maintained with the Preferred Alternative. The Preferred Alternative with the NE 185th Street Station would have access to NE 185th Street only for bus, paratransit, and passenger drop off/pick up activity. A park-and-ride garage would be constructed on the west side of I-5 from the station. There is some potential for cut-through traffic to access the station via local streets between 8th Avenue NE and 10th Avenue NE, north of NE 185th Street.

Preferred Alternative Options: NE 130th Street Station and Shoreline Stadium Park-and-Ride Garage

Similar to the Preferred Alternative, the NE 130th Street Station could restrict driveway access to right turns only on 5th Avenue NE opposite the station. Access to and from NE 131st Place at 5th Avenue NE would be maintained, requiring a gap in the raised median. Access to and from the North Seattle Church of the Nazarene would be maintained, requiring a revised median for full access.

Construction of a park-and-ride garage at the Shoreline Stadium site would replace the existing parking lot with a garage, maintain a driveway access to NE 185th Street, and include a new driveway access to 5th Avenue NE.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

No change in property access or local circulation would result with Alternative A1 north of NE Northgate Way to North 117th Street. 1st Avenue NE would be reconstructed with the same access and connections as currently exist, including the trail connection to 3rd Avenue NE along NE 116th Street alignment. The alternative would maintain and restore access to properties along the alignment that would remain, including the sole access to the church at the end of 3rd Avenue NE north of NE 117th Street.

Alternative A1 would include the reconstruction of the NE 130th Street interchange, which is similar to the Preferred Alternative.

No changes in property access or local circulation are expected along 5th Avenue NE south of NE 145th Street with Alternative A1.

NE 145th Street Station

No change in property access or local circulation would be needed with Alternative A1, with Option 1, along 5th Avenue NE near the NE 145th Street Station. There is

some potential for cut-through traffic to access the station via local streets between 5th Avenue NE and 8th Avenue NE.

North of the NE 145th Street Station to NE 175th Street, Alternative A1 is similar to the Preferred Alternative.

NE 185th Street Station

Alternative A1 would reconstruct 5th Avenue NE north of NE 180th Street to maintain access to residences along the new roadway. 5th Avenue NE north of NE 185th Street would be rerouted to a new intersection, and property access would be maintained with Alternative A1. A new local roadway connection would be constructed to 8th Avenue NE from the proposed station. There is some potential for cut-through traffic to access the station via local streets between 8th Avenue NE and 10th Avenue NE, north of NE 185th Street.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

The Alternative A3 guideway alignment would require reconstruction of the trail connection between the NE 117th Street overcrossing at 1st Avenue NE and 3rd Avenue NE (along NE 116th Street) and would require a new driveway access to a church from NE 117th Street at 3rd Avenue NE. Access along the Alternative A3 guideway would remain the same as existing from approximately NE 120th Street through the NE 130th Street interchange area and north to NE 145th Street.

NE 145th Street Station

Alternative A3 with Option 2 would relocate the northbound on-ramp to I-5 from 5th Avenue NE. The conceptual design for this alternative indicates that the access along 5th Avenue NE could be revised to right turns only to minimize conflicts with station area or ramp traffic. This revision could affect additional residential parcels that need access to be maintained to 5th Avenue NE.

North of NE 148th Street to NE 158th Street, there would be no change in access or circulation with Alternative A3. Similar to the Preferred Alternative, reconstruction of 2nd Avenue NE from NE 158th Street to NE 161st Street and reconstruction of 1st Avenue NE from NE 170th Street to NE 174th Street would maintain property access and local circulation.

NE 185th Street Station

The Alternative A3 guideway would cross 5th Avenue NE south of NE 185th Street, where property driveways could be affected by limited sight distance (which could be mitigated through design).

Alternative A3 would add two access points at the station area—a driveway to 8th Avenue NE and a fourth leg to the existing intersection of 5th Avenue NE and NE 185th Street. This access would have signal control with the station implementation. The potential for cut-through traffic to access the station is similar to the Preferred Alternative.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

The Alternative A5 guideway alignment would require reconstruction of the trail connection between the NE 117th Street overcrossing at 1st Avenue NE and 3rd Avenue NE (along NE 116th Street), and also require a new driveway access to the church from NE 117th Street at 3rd Avenue NE.

NE 130th Street Station

Similar to the Preferred Alternative, Alternative A5 would include the reconstruction of the NE 130th Street interchange, and there could be changes in property access and local circulation on 5th Avenue NE. No change in property access or local circulation would be needed along 5th Avenue NE south of NE 148th Street. No change in access or circulation would be required south of NE 155th Street.

NE 155th Street Station

Alternative A5 would replace the 2nd Avenue NE cul-de-sac south of NE 155th Street (and 10 residences) with a park-and-ride garage with two driveways to NE 155th Street. Station access and on-street bus activity under the I-5 bridges may increase potential conflicts near the 1st Avenue NE and NE 155th Street intersection just west of I-5. Station area design would incorporate bus stops, crosswalks, and driveway configurations to accommodate the range of travel modes expected at the station.

There is some potential for cut-through traffic to access the station via local streets between 3rd Avenue NE and 5th Avenue NE north of NE 155th Street.

Similar to the Preferred Alternative, the reconstruction of 2nd Avenue NE from NE 158th Street to NE 161st Street under Alternative A5 would maintain access and local circulation.

NE 185th Street Station

Property access and local circulation with Alternative A5 would be the same as for the Preferred Alternative. Alternative A5 would reconstruct 5th Avenue NE north of NE 180th Street and maintain access to residences along the new roadway. Three new access driveways to 8th Avenue NE would be constructed with the station.

Alternative A5 would need to maintain access to residences along the guideway from NE 189th Street, west of 8th Avenue NE.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

NE 130th Street Station

Alternative A7 impacts would be the same as for Alternative A3 from Northgate Station to NE 130th Street. At NE 131st Street and 5th Avenue NE (a residential cul-de-sac) and at the North Seattle Church of the Nazarene, Alternative A7 would need to maintain current access with an opening in the raised median opposite the station.

Access or circulation would not be changed from the NE 130th Street Station to NE 155th Street.

NE 155th Street Station

Property access and local circulation with Alternative A7 in the NE 155th Street Station area would be the same as with Alternative A5.

NE 185th Street Station

Property access and local circulation with Alternative A7 in the NE 185th Street Station area would be the same as with Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

NE 130th Street Station

Same as for Alternative A5, Alternative A10 would affect property access and local circulation from Northgate Station through the NE 130th Street Station area.

NE 145th Street Station

Similar to the Preferred Alternative, Alternative A10 would affect property access and local circulation from the NE 145th Street Station area to NE 180th Street.

NE 185th Street Station

Property access and local circulation with Alternative A10 would be the same as for Alternative A5. Alternative A10 would affect property access and local circulation from NE 180th Street through the NE 185th Street Station area.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Same as for Alternative A3, Alternative A11 would affect property access and local circulation from the Northgate Station along the guideway to NE 125th Street.

NE 130th Street Station

Same as for Alternative A7, Alternative A11 would affect property access and local circulation from NE 125th Street through the NE 130th Street station area. Along the guideway from NE 140th Street to NE 158th Street, property access and local circulation would be affected in the same manner as under Alternative A3.

NE 145th Street Station

Property access and local circulation with Alternative A11 in the NE 145th Street Station area would be the same as Alternative A3.

Along the guideway from NE 158th Street to NE 180th Street, property access and local circulation would be affected in the same manner as under the Preferred Alternative.

NE 185th Street Station

Along the guideway from NE 180th Street and through the NE 185th Street Station, property access and local circulation would be affected in the same manner as under Alternative A3.

Segment B: Shoreline to Mountlake Terrace

Preferred Alternative (B2 Modified): East Side to Mountlake Terrace Transit Center to West Side

Mountlake Terrace Transit Center Station

The Preferred Alternative would have no effects on property access and local circulation. Reconstruction of the NE 195th Street pedestrian bridge over I-5 would maintain connections for nonmotorized travel to the NE 195th Street corridor. Property access to the school property south of the Mountlake Terrace Transit Center Station would be maintained with the guideway alignment. One new access driveway would be added to the transit center and station, with a connection to 236th Street SW.

Construction of the guideway under the 228th Street SW overcrossing would maintain traffic and local circulation along 228th Street SW and 230th Street SW. The guideway alignment along the west side of I-5 would maintain property access and not change local circulation through Segment B.

At the 220th Street SW interchange, the Preferred Alternative moves the southbound ramp terminus to the east. This change would reduce the distance between the northbound and southbound ramp intersections at 220th Street SW but is not anticipated to affect property access and local circulation.

Preferred Alternative: Optional 220th Street SW Station (elevated)

220th Street SW Station (elevated)

Property access and local circulation would change for the optional 220th Street SW Station, located south of 220th Street SW, with a new driveway access on 220th Street SW to the park-and-ride and station area. Station access at 220th Street SW would have signalized control.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

Mountlake Terrace Transit Center Station

Alternative B1 would have no effects on property access and local circulation. Reconstruction of the NE 195th Street pedestrian bridge over I-5 would maintain connections for nonmotorized travel to the NE 195th Street corridor. Property access to the school property south of the Mountlake Terrace Transit Center Station would be maintained with the guideway alignment. One new access driveway would be added to the transit center and station, with a connection to 236th Street SW.

Alternative B2: East Side to Mountlake Terrace Transit Center to West Side

Mountlake Terrace Transit Center Station

Similar to Alternative B1, Alternative B2 would affect property access and local circulation from the Mountlake Terrace Transit Center Station to the south.

Reconstruction of the approach to the 228th Street SW roadway crossing over I-5 would maintain local circulation. Reconstruction of a cul-de-sac on 227th Street SW west of I-5 would maintain the same access as currently exists. The guideway alignment along the west side of I-5 would maintain property access and not change local circulation through Segment B.

Alternative B2A: Optional 220th Street SW Station (elevated)

220th Street SW Station (elevated)

Property access and local circulation for Alternative B2A with a station over 220th Street SW would be affected the same as with the Alternative B2 alignment. The I-5 southbound ramp intersection with 220th Street SW would be relocated eastward to

allow for the station location. Station access would be provided to 219th Street SW with an arterial connection on 64th Avenue West at 220th Street SW. There is some potential for cut-through traffic to access the station via local streets between 66th Avenue West and 64th Avenue West, north of 220th Street SW.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

Mountlake Terrace Freeway Station

Alternative B4 would not affect property access or local circulation through the Segment B portion of the project corridor. The guideway alignment within the I-5 median would require reduced shoulder width (to 3 feet) at the south approach to the Mountlake Terrace Freeway Station in the median.

Segment C: Mountlake Terrace to Lynnwood

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

Lynnwood Park-and-Ride Station

The Preferred Alternative would affect property access and local circulation with the reconstruction of the 208th Street SW access roadway along the west side of I-5 for maintaining access to properties north of the Interurban Trail and east of 52nd Avenue West. Property access may be modified with the design but would be maintained with the relocated driveway connections. Property access would be maintained from 204th Street SW and 208th Street SW.

The guideway would cross the extension of 208th Street SW and the Interurban Trail, and would pass above 46th Avenue West. The tail track and crossover would extend above 44th Avenue West and end on the south side of Alderwood Mall Boulevard, just east of 44th Avenue West. The Preferred Alternative would include reconfiguration of the park-and-ride surface lot and construction of a park-and-ride garage at the Lynnwood Transit Center and light rail station.

Alternative C1: 52nd Avenue West to 200th Street SW

200th Street SW Station

Alternative C1 would affect property access and local circulation with the connection to the rail alignment in the median of I-5. This effect would include changes to 10 property driveways along the east side of 52nd Avenue West/Cedar Valley Road where driveway operation may be constrained due to limited sight distance, based on column locations for the elevated guideway. The guideway would cross 208th Street

SW, 206th Street SW, and 204th Street SW, including the Interurban Trail where column locations may restrict sight distance. This alternative would need to maintain full access, as much as possible, for these property driveways.

The guideway would cross an apartment complex west of 48th Avenue West, where site driveway access would be changed and on-site circulation would need to be modified to maintain site access to 200th Street SW.

The guideway would cross 48th Avenue West adjacent to the existing traffic signal. The tail track would be elevated over the 46th Avenue West signal and three driveways to 200th Street SW, where visibility may be limited by the column locations; in addition, driveways could be restricted to right turns only.

Alternative C1 connecting to a rail alignment along the west side of I-5 would affect two additional driveways on 52nd Avenue West with column locations for the elevated guideway.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

Lynnwood Transit Center Station

Property access and local circulation for Alternative C2 would be affected in the same manner as under Alternative C1 south of 204th Street SW (with five driveways affected). At 204th Street SW, the guideway turns east across the properties where on-site circulation would need to be modified for the remaining buildings and access to Cedar Valley Road. The parking lots for these properties could be redesigned to connect under the guideway.

The Alternative C2 tail track and crossover would extend above the park-and-ride facility, the Interurban Trail, and the southbound on-ramp to I-5. On-site circulation of the park-and-ride would be modified to accommodate the columns.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Lynnwood Park-and-Ride Station

Alternative C3 would affect property access and local circulation with the reconstruction of the 208th Street SW access roadway along the west side of I-5 for maintaining access to properties north of the Interurban Trail and east of 52nd Avenue West. Property access may be modified with the design but maintained with the relocated driveway. Property access is from 204th Street SW and 208th Street SW.

The guideway would cross the extension of 208th Street SW, the Interurban Trail, and the HOV direct access ramp on the approach to the Lynnwood Park-and-Ride Station. The tail track and crossover would extend above the Interurban Trail and pedestrian bridge, over the southbound on-ramp to I-5, over 44th Avenue West, and over a retail property development. This alignment would affect on-site access to parking lots that

serve buildings set back from 44th Avenue West. Alternative C3 would include reconfiguration of parking lots and traffic circulation to maintain access and parking circulation for these properties east of 44th Avenue West.

5.5 Nonmotorized Facilities

This section presents the evaluation of 2035 forecasted pedestrian and bicycle trips generated by the project and the potential impact to existing nonmotorized facilities. Key observations and findings are as follows:

- With the No Build Alternative, pedestrian and bicycle activities would have a modest increase due to new developments, new pedestrian and bicycle facilities, and/or a mode shift to walking and bicycling.
- Lynnwood Link Extension would substantially increase the number of pedestrians around stations.
- The highest pedestrian volumes would occur during the PM peak period when trains serve stations every 4 minutes. PM peak period boardings also would generate a high volume of pedestrians arriving to the stations, equivalent to from 27 to 77 percent of the alighting passengers.
- Most pedestrians would use station area facilities to move between the station and the park-and-ride, passenger pick-up/drop-off area, and bus stops.
- Pedestrian movements would function at very high service levels due to wide plaza areas and sidewalks from the stations to the park-and-rides, passenger pick-up/drop-off areas, and bus stops. At the NE 145th Street Station, for all alternatives except the Preferred Alternative pedestrian volumes to and from the station would affect signal operations because the volume of pedestrians would impede westbound vehicles on NE 145th Street turning right onto 5th Avenue NE, resulting in westbound back-ups on NE 145th Street and potentially a longer delay for north-south traffic. This is not expected to occur with the Preferred Alternative however, because it includes the addition of a westbound right turn pocket on NE 145th Street approaching 5th Avenue NE, and has provisions for buses to enter the station rather than drop transferring riders on the east side of 5th Avenue NE; therefore requiring them to cross the street to reach the station.
- The existing sidewalk on 46th Avenue West at the Lynnwood Transit Center Station could become overcrowded with the alternatives. Potential transit-oriented development and/or mitigation could provide a wider sidewalk.
- Station construction often includes reconstruction of adjacent streets, which would include construction of pedestrian and bicycle facilities at or above local jurisdictional standards and ADA accessibility. Sidewalk widths would exceed standards where warranted by pedestrian volumes and LOS.

5.5.1 Pedestrian Facilities

Pedestrian facilities were inventoried within 0.50 mile of the proposed light rail stations. The Lynnwood Link Extension would substantially increase the number of pedestrians in and around the stations. The inventory of pedestrian facilities discussed in Chapter 4 also identified the activity centers that would generate higher volumes of pedestrians between the activity center and the station, including multifamily housing, commercial areas, community centers, and community colleges (see Section 4.5.1).

Pedestrian LOS was analyzed within 300 feet of the station entrances. Pedestrian LOS for sidewalks was analyzed using the methodology from the *Highway Capacity Manual* (Transportation Research Board 2000) and the TCQSM. Pedestrian LOS is a measure of the walking conditions on a sidewalk. LOS A represents ample spacing between pedestrians on a sidewalk for free-flow walking speeds. LOS F represents unavoidable crossings between pedestrians on a sidewalk or path, preventing free-flow walking speed and movement.

The worst condition LOS would occur as trains are unloading during the PM peak hour when trains are full and arriving every 4 minutes. PM peak hour boardings are also expected to be substantial by 2035. The number of pedestrians using sidewalks within 300 feet of the stations was based on an estimate of the number of boarding and alighting transit riders that would walk to a park-and-ride lot, passenger pick-up/drop-off area, bus stops, and pedestrian trips to neighborhoods or other nearby destinations. The Sound Transit Ridership Model provided the number of PM peak hour maximum boardings and alightings as “walk trips” and “bus trips.” Boardings and alightings by station for the Preferred Alternative are shown in Tables 5-33 and 5-34.

The walk trips were distributed along walk routes to neighborhoods in the vicinity of the stations. The bus trips at each station represent a walk trip through the station area and then pedestrian movements distributed to the bus stops. Pedestrian trips were generated from the park-and-ride lot based on the number of stalls and an assumption that the park-and-ride empties in 3 hours. The logical walk route was followed from the park-and-ride to the station platform to determine pedestrian volumes for the facilities. Additional trips were generated and distributed to passenger pick-up/drop-off areas based on the 2035 peak-hour passenger pick-up/drop-off forecasts. Additional pedestrian volumes may be generated by those using nearby on-street parking. A summary of the estimated pedestrian volumes during the PM peak hour is presented in Table 5-32 and Table 5-33. Table 5-32 presents the estimated number of alighting passengers at each station and the number of pedestrians generated that transfer to their mode of egress. Table 5-33 summarizes the number of pedestrians boarding a train during the PM peak hour and the estimated number by mode of access. The estimates are presented per train and per PM peak hour.

**Table 5-32. 2035 Estimated Pedestrian Trips per Train at Stations—PM Peak Hour
Light Rail Alighting to Mode Transfer**

Station	Walk ^a	Bicycle ^a	Bus ^a	Park-and-Ride ^b	Pick-up/Drop-off ^c	Total per Train	Total PM Peak Hour
NE 130th Street	8	1	32	2	1	44	660
NE 145th Street	19	1	32	11	1	64	960
NE 155th Street ^d	3	1	1	11	1 ^e	17	255
NE 185th Street	8	1	21	11	1	42	630
Mountlake Terrace	11	3	35	20	1	70	1,050
220th Street SW	8	1	3	4	1	17	255
Lynnwood	27	5	187	42	2	263	3,945

Sources:

^a Sound Transit Ridership Model revised forecast for the Preferred Alternative^b Number of parking stalls; park-and-ride empties in 3 hours^c 2035 Passenger Pick-up/Drop-off Forecasts: Minimum 1 per train.^d NE 155th Street Station was not included in the Preferred Alternative ridership forecast. Numbers reflect earlier forecast.^e Less than one per train.**Table 5-33. 2035 Estimated Pedestrian Trips per Train at Stations—PM Peak Hour
Light Rail Boarding from Mode of Access**

Station	Walk ^a	Bicycle ^a	Bus ^a	Park-and-Ride ^b	Pick-up/Drop-off ^c	Total per Train	Total PM Peak Hour
NE 130th Street	5	1 ^e	27	2	1 ^e	34	510
NE 145th Street	5	1 ^e	24	6	1 ^e	37	555
NE 155th Street ^d	3	1	1	2	1 ^e	8	120
NE 185th Street	3	1	11	5	1 ^e	20	300
Mountlake Terrace	5	1	13	8	1 ^e	28	420
220th Street SW	3	1 ^e	3	2	1 ^e	10	150
Lynnwood	11	3	37	11	1 ^e	63	945

Sources:

^a Sound Transit Ridership Model revised forecast for the Preferred Alternative^b Number of parking stalls; park-and-ride empties in 3 hours^c 2035 Passenger Pick-up/Drop-off Forecasts: Minimum 1 per train.^d NE 155th Street Station was not included in the Preferred Alternative ridership forecast. Numbers reflect earlier forecast.^e Less than one per train.

Conceptual station area design concepts, shown in Appendix F of the Final EIS, were the basis for analysis of the Preferred Alternative. Sidewalk widths on street segments were based on the local jurisdiction sidewalk standards for the facility as a minimum and Sound Transit sidewalk standards for transit facilities. Wider sidewalks could be shown on the conceptual plans where pedestrian volumes would

require the additional width. The narrowest walkway width along a pedestrian route was used to evaluate the pedestrian LOS condition. In general, plazas and walking areas surrounding the station would be constructed with wide pedestrian areas. A detailed analysis of pedestrian impacts at the stations is presented below. Pedestrian mobility is discussed in terms of the PM peak period, when the highest volumes are away from the station; however, pedestrian volumes from PM peak hour boarding passengers were also included in the analysis.

Segment A: Seattle to Shoreline

No Build Alternative

Pedestrian facilities in the vicinity of the proposed light rail stations within Segment A are expected to be LOS A in 2035 without the project.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

Reconstruction of 5th Avenue NE in the vicinity of NE 130th Street, and reconstruction of the NE 130th Street overcrossing would improve the pedestrian facilities to meet current design standards.

NE 145th Street Station (elevated)

Park-and-ride users would access the station from the ground floor of the park-and-ride using crosswalks across the bus access roadway. The passenger pick-up/drop-off area would be along a circulating roadway near the south end of the station. The paratransit load/unload zone would be inside the park-and-ride garage and also use the crosswalks across the bus roadway.

Buses would enter the station at the same driveway as the park-and-ride users and exit at the north end of the site. Buses would circulate in a one-way clockwise direction. The egress is adjacent to the northbound I-5 on-ramp. The Bus bays are along the west side of the park-and-ride garage and adjacent to the station plaza. Light rail passengers transferring to a bus would use elevators/stairs/escalators to reach the plaza level and walk across the plaza to the bus bays. Most light rail passengers would transfer to buses at the plaza bus bays. The highest volume of pedestrians would occur within the station plaza areas; these areas would function at LOS A.

A northbound and southbound bus bay is provided on 5th Avenue NE, south of the park-and-ride and bus egress location. Light rail passengers transferring to a southbound bus on 5th Avenue NE would need to cross the parking garage entrance. This entrance would be designed with a crosswalk and enhanced with variations in pavement materials or pavement markings. Pedestrians would continue along a 10-foot-wide sidewalk within the station and a 10 to 12 foot sidewalk on 5th Avenue

NE, consistent with Sound Transit standards for transit facilities. The pedestrian volume on this sidewalk includes passengers walking from the station to the southbound bus, bus riders alighting and walking to the station, and pedestrians walking to and from neighborhoods to the north. Pedestrian volumes during the PM peak hour would result in an LOS C condition.

Passengers transferring to a northbound bus would walk across the station plaza to the intersection of NE 145th Street and 5th Avenue NE, cross 5th Avenue NE on the north side of NE 145th Street at a signalized crossing, and arrive at the bus stop. Bus platforms would be a minimum of 10 feet wide, which is consistent with King County Metro design guidelines. The pedestrian volume within the crosswalk on the north leg includes light rail passengers walking to the northbound bus platform, bus riders alighting and walking to the station, and pedestrians walking to and from the neighborhoods to the east. Pedestrian volume within the crosswalk on the south leg and on the sidewalk on the east side of 5th Avenue NE would be approximately LOS B. The conceptual design for the Preferred Alternative shows bus stops on NE 145th Street west of 5th Avenue NE to provide for future east-west bus service. King County Metro's service integration plan prepared for this project does not include buses on NE 145th Street. East-west service is provided using the north-south bus bays and NE 155th Street for the east-west movement to avoid the traffic congestion at the intersection of NE 145th Street and 5th Avenue NE. If the westbound bus were in use, passengers transferring to a westbound bus would walk within the station area to the bus stop on NE 145th Street. Riders or any other pedestrians crossing the west leg of NE 145th Street and 5th Avenue NE would use a pedestrian/bicycle pathway under the NE 145th Street bridge. There is no forecast of pedestrian volumes to these stops. Under existing conditions there is no sidewalk on the west leg of the intersection. (Refer to Section 5.4 for analysis of signal operations with a crosswalk on the west leg.) Pedestrians walking to other destinations would use the existing sidewalks beyond the reconstructed segments of NE 145th Street and 5th Avenue NE.

NE 185th Street Station (at-grade)

Park-and-ride users would access the station from the south end of the park-and-ride (located on the west side of I-5) via a pedestrian bridge over I-5 constructed adjacent to and on the north side of the existing NE 185th Street bridge. Pedestrian volumes on the bridge would include passengers leaving the station to access the park-and-ride, some boarding passengers from the park-and-ride, and pedestrians traveling to and from neighborhoods and the Shoreline community facilities. The pedestrian bridge is approximately 12 feet wide at the narrowest point, resulting in an LOS C condition. LOS C is sufficient for normal walking speeds and for bypassing other pedestrians. Movements in the reverse direction can cause minor conflicts.

Pedestrian movement on an 8-foot-wide sidewalk to and from the east, and within the crosswalks, is estimated to operate at LOS B conditions.

Passenger pick-up/drop-off would occur at angled parking spaces located on the east side of the station across from the circulating roadway. Paratransit load/unload would occur adjacent to the plaza, at the south end, very near to the elevators to the platform.

Light rail passengers transferring to a bus would walk across the plaza to the bus platforms along the circulating roadway adjacent to the plaza. Two additional bus bays are located on NE 185th Street. Passengers traveling to and from these bus stops would access the bus platform from the south end of the plaza for westbound buses and cross NE 185th Street to access the eastbound bus platform. The 8-foot-wide sidewalk would function at an LOS B condition. Passengers transferring to an eastbound bus would use the crosswalk at the intersection of the station entrance and 7th Avenue NE. This intersection would also be used by general purpose traffic, buses, paratransit, and for vehicles accessing disabled permit parking. The intersection would experience multiple mode use with potential conflicts with pedestrian movements. Light rail passengers walking to their destinations would use the reconstructed sidewalks that are 8 feet wide, which would meet City of Shoreline design guidelines. These new sidewalks are projected to function at LOS B.

Pedestrians walking beyond the reconstructed street segments would use existing sidewalks that are expected to function at LOS A conditions.

Shoreline Stadium Garage—Optional

The Shoreline Stadium garage would be a shared facility, serving as a park-and-ride during daytime hours, and accommodating daytime stadium event parking as well as parking for events on evenings and weekends. Pedestrian movements discussed for the NE 185th Street Park-and-Ride above would continue across the north leg of 5th Avenue NE with the park-and-ride located farther to the west. A standard crosswalk would provide adequate space for pedestrians. Additional pedestrian warning signs would be provided for drivers on NE 185th Street and 5th Avenue NE due to the relatively frequent and high volume of pedestrians across 5th Avenue NE.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station Option 1 (elevated)

Park-and-ride users would access the station at the north end directly from the parking garage. The passenger pick-up/drop-off platform is inside the parking garage, and these users would access the station similarly. The highest volume of pedestrians would occur within the station plaza areas; these areas would function at LOS A.

Light rail passengers transferring to a southbound bus would use the station plaza to access the bus stop. Passengers transferring to a northbound bus would walk across the station plazas to the intersection of NE 145th Street and 5th Avenue NE, cross 5th Avenue NE on the north side of NE 145th Street, and arrive at the bus stop. The sidewalk on 5th Avenue NE would be a minimum of 8 feet wide, which is consistent with City of Shoreline design guidelines. The crosswalk and sidewalk would function at LOS F conditions and would require a 16-foot-wide crosswalk and sidewalk to reach LOS D conditions.

King County Metro's service integration plan prepared for this project does not include buses on NE 145th Street. East-west service is provided using the north-south bus bays and NE 155th Street for the east-west movement to avoid the traffic congestion at the intersection of NE 145th Street and 5th Avenue NE. If the westbound bus were in use, passengers transferring to a westbound bus would walk within the station area to the bus stop on NE 145th Street. Riders transferring to an eastbound bus would cross the west leg of NE 145th Street and 5th Avenue NE. Station area directional signage would direct pedestrians away from the I-5 on-ramps; however, some pedestrians may choose to cross the I-5 northbound on-ramp if they were unfamiliar with the park-and-ride, or if they have destinations north of the station on the west side of 5th Avenue NE. There would be few gaps in the traffic stream for pedestrians to cross the ramp terminal.

Pedestrians walking to other destinations would use the existing sidewalks beyond the reconstructed segments of NE 145th Street and 5th Avenue NE. The freeway flyer stops and the pedestrian paths to NE 145th Street from the flyer stops are assumed to be removed with the project.

NE 185th Street Station Option 1 (at-grade)

Park-and-ride users would leave the NE 185th Street Station at its south end and cross over I-5 using a 12-foot-wide pedestrian walkway on the north side of a reconstructed bridge to access the parking garage on the west side of I-5. The 10-foot-wide sidewalk is estimated to function at LOS C.

Pick-up/drop-off passengers would walk from the station onto the plaza, along the bus access driveway that intersects NE 185th Street opposite 5th Avenue NE, and then cross the driveway to the pick-up/drop-off area on the north side of NE 185th Street. A 10-foot-wide crosswalk would operate at LOS B.

Light rail passengers transferring to a bus would walk across the plaza to the bus platforms located on the east edge of the reconstructed NE 185th Street bridge. Those transferring to eastbound buses would need to cross NE 185th Street on the west side of 5th Avenue NE.

Light rail passengers walking to their destinations would use the reconstructed sidewalks that are at least 6 feet wide and meet City of Shoreline design guidelines. These new sidewalks would function at LOS A. Pedestrians walking beyond the reconstructed street segments would walk on existing sidewalks that are also expected to function at LOS A conditions.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station Option 2 (elevated)

With Option 2, park-and-ride users would access the parking garage using the plaza area at the center of the station, as would pedestrians walking to the pick-up/drop-off platform. Passengers transferring to southbound buses on 5th Avenue NE would need to cross the parking garage entrance. This entrance would be designed with a crosswalk and enhanced with variations in pavement materials or pavement markings. Passengers transferring to northbound buses on 5th Avenue NE would follow the same routes as in Alternative A1, Option 1, also resulting in an LOS F condition with a 10-foot-wide crosswalk and 8-foot-wide sidewalk.

In the project design, the freeway flyer stops and the pedestrian paths to NE 145th Street would be removed.

NE 185th Street Station Option 2 (elevated)

Park-and-ride users leaving the station would have to walk across the plaza and cross the park-and-ride and bus access roadway to enter the parking garage. Assuming a 10-foot-wide crosswalk is provided, this crossing would function at LOS B.

Pick-up/drop-off passengers would walk to the south end of the station, along a sidewalk on the north side of NE 185th Street, and cross the bus entrance/exit to reach the pick-up/drop-off platform on the north side of NE 185th Street. These pedestrians would also experience LOS B conditions.

As in Option 1, light rail passengers transferring to a bus would walk across the plaza to the bus platform located on the east edge of the reconstructed NE 185th Street bridge. Those transferring to eastbound buses would need to cross NE 185th Street on the west side of 7th Avenue NE. A 10-foot-wide crosswalk and 8-foot-wide sidewalk would function at LOS B conditions.

Light rail passengers walking to their destinations would use the reconstructed sidewalks and experience LOS A conditions. Pedestrians walking beyond the reconstructed street segments would walk on existing sidewalks and experience LOS A conditions. Note that pedestrians walking from the station to the North City business district would encounter a missing sidewalk segment on NE 180th Street between 9th Avenue NE and 15th Avenue NE.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations**NE 130th Street Station Option 1 (at-grade)**

Park-and-ride users would need to walk across 5th Avenue NE in the vicinity of the potential leased park-and-ride lot. Pedestrians would experience LOS A conditions with a 10-foot-wide sidewalk. The crosswalk is an unsignalized crossing. Pedestrian warning signs, flashers, or other safety devices would alert drivers of the midblock crossings. Passengers would access the pick-up/drop-off area adjacent to the station.

Light rail passengers leaving the station to transfer to a westbound bus would walk to the south end of the plaza and along a 10-foot-wide sidewalk to a bus stop on the reconstructed bridge. Light rail passengers transferring to an eastbound bus would cross NE 130th Street and walk along the new sidewalk on the reconstructed bridge to the bus platform. These pedestrians would also experience LOS E conditions. A 12-foot-wide crosswalk and sidewalk would reach LOS D conditions. The City of Seattle sidewalk standard for pedestrian zones in front of a transit station is 10 to 12 feet wide.

Light rail passengers walking to destinations west of the station would use new sidewalks on the reconstructed bridge along NE 130th Street. Traveling east of the station, passengers would walk on reconstructed portions of 5th Avenue NE and Roosevelt Way NE. Sidewalks would be 8 feet wide, which is consistent with City of Seattle design guidelines and function at LOS A. Beyond the reconstructed street segments, pedestrians would walk on the existing sidewalks. North of the station there is a sidewalk on the east side of 5th Avenue NE up to the Jackson Park Golf Course, but not north of that point. The existing 5-foot-wide sidewalk would function at LOS A.

NE 155th Street Station (elevated)

At the NE 155th Street Station, the passenger drop-off/pick-up area is on the south side of NE 155th Street adjacent to the parking garage. Park-and-ride users would walk across from Level 1 of the parking garage to a walkway on the south side of the fire station, and then access the elevated station platform using stairs, escalator, or elevator. Passengers walking to the pick-up/drop-off area would descend from the station at the south end and use a pedestrian walkway along the south and east side of the fire station. The wide plaza would operate at LOS A conditions.

Load and unload zones for buses would be located on both sides of NE 155th Street under the station, with the westbound bus platform approximately 300 feet to the west of the station. Light rail passengers transferring to a bus would take the stairs or an elevator to street level on either side of NE 155th Street to reach the bus zones. Platforms and plazas would operate at LOS A for pedestrian volume.

Passengers walking to their destinations would use reconstructed sidewalk segments that are 6 feet wide, which is consistent with City of Shoreline standards. Beyond the reconstructed street segments pedestrians would use existing sidewalks. These facilities would also operate at LOS A.

NE 185th Street Station Option 3 (at-grade)

With Alternative A5, Option 3 would function the same as Option 2 for pedestrians, except for a heavier volume of pedestrians walking east on NE 185th Street to access the additional park-and-ride spaces that would be located at the Seattle City Light property. Pedestrians accessing this park-and-ride would cross 8th Avenue NE using a 10-foot-wide crosswalk that would function at LOS A (the crosswalk location would be identified in the later design); however, the short stretch of sidewalk between 8th Avenue NE and the additional park-and-ride space is currently 6 feet wide and would operate at LOS C unless widened further.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

NE 130th Street Station Option 2 (elevated)

With Alternative A7, park-and-ride users would walk to the north end of the NE 130th Street Station to access the surface park-and-ride lot using wide plazas. Passengers would access the passenger pick-up/drop-off area adjacent to the station. These facilities would function at LOS A.

Light rail passengers leaving the station to transfer to a westbound bus would walk to the south end of the plaza and along a 10-foot-wide sidewalk to a bus stop on the reconstructed bridge. Light rail passengers transferring to an eastbound bus would cross NE 130th Street and walk along the new sidewalk on the reconstructed bridge to the bus platform. These pedestrians would also experience LOS E conditions. A 12-foot-wide crosswalk and sidewalk would reach LOS D conditions. The City of Seattle sidewalk standard for pedestrian zones in front of a transit station is 10 to 12 feet wide.

Light rail passengers walking to their destinations would use the reconstructed sidewalk up to the bridge abutment on reconstructed portions of 5th Avenue NE and Roosevelt Way NE. Sidewalks would be a minimum of 8 feet wide, which is consistent with City of Seattle design guidelines. Beyond the reconstructed street segments, pedestrians would walk on the existing sidewalks. Pedestrians would also use the existing sidewalks over the bridge. Across the NE 130th Street bridge north of the station, there is a sidewalk on the east side of 5th Avenue NE that extends only to the golf course. The existing 5-foot-wide sidewalk would function at LOS A.

NE 155th Street Station (elevated)

The pedestrian impacts with Alternative A7 would be the same as with Alternative A5.

NE 185th Street Station (at-grade)

The pedestrian impacts with Alternative A7 would be the same as with Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

NE 130th Street Station Option 1 (at-grade)

The pedestrian impacts with Alternative A10 would be the same as with Alternative A5.

NE 145th Street Station Option 1 (elevated)

The pedestrian impacts with Alternative A10 would be the same as with Alternative A1, except that 150 more park-and-ride spaces would be provided at the NE 145th Street Station, resulting in more transit riders walking to the park-and-ride lot.

NE 185th Street Station Option 3 (at-grade)

The pedestrian impacts with Alternative A10 would be the same as with Alternative A5.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

NE 130th Street Station Option 2 (elevated)

The pedestrian impacts with Alternative A11 would be the same as with Alternative A7.

NE 145th Street Station Option 2 (elevated)

The pedestrian impacts with Alternative A11 would be the same as with the Preferred Alternative.

NE 185th Street Station Option 2 (elevated)

The pedestrian impacts with Alternative A10 would be the same as with Alternative A3.

Segment B: Shoreline to Mountlake Terrace

No Build Alternative

Pedestrian facilities in the vicinity of the light rail stations within Segment B are expected to be LOS A in 2035 without the Lynnwood Link Extension.

Preferred Alternative (B2 Modified): East Side to Mountlake Terrace Transit Center to West Side

The NE 195th Street pedestrian/bicycle bridge over I-5 would be reconstructed with all Segment B alternatives. The facility would be constructed to meet or exceed WSDOT and local jurisdiction standards. The current concept design is 14 feet wide.

Mountlake Terrace Transit Center Station (elevated)

Park-and-ride users would walk to access the station from the existing Mountlake Terrace Park-and-Ride (660 spaces) or a reconfigured surface parking lot (approximately 200 spaces). From the existing park-and-ride lot passengers would enter and exit the park-and-ride garage via stairs or elevator to the surface, walk east across an internal circulation roadway using a crosswalk, and access the plaza at the north end of the station. The hourly volume of pedestrians leaving the station and going to the garage, combined with some park-and-ride users accessing the station would result in LOS C conditions with a 12-foot-wide crosswalk. The 10-foot-wide walkway into the garage would result in LOS D conditions.

Pedestrians in the crosswalk would need to be aware of traffic coming to and from the garage driveway to the north and to and from the surface parking lot, including buses using the internal circulation roadway. Drivers leaving the surface lot may have their focus on the vehicles exiting the park-and-ride, attempting to make a left turn between gaps in the exiting traffic stream. Immediately after entering the traffic stream, from a left-hand turn, the driver will be faced with a high volume of pedestrians within the crosswalk.

Passengers from the surface lot would walk through the park-and-ride lot and directly onto the station plaza. The passenger drop-off/pick-up area is adjacent to the plaza on the east side of the station and within the surface parking lot. Paratransit loading/unloading would be from a bay located adjacent to the plaza at the north end near escalators and an elevator.

Light rail passengers transferring to a bus would either walk to bus platforms along the west side of the plaza or to bus platforms on 236th Street SW. To access the bus platforms on 236th Street SW, light rail passengers would use the station platform to access stairs or elevators on either side of 236th Street SW, avoiding a street crossing. These facilities would function at LOS A conditions.

A multi-use pedestrian/bicycle facility is under design along the north side of 236th Street SW and Lakeview Drive, from the west side of the freeway interchange to the Interurban Trail. From the station, pedestrians walking west from the station would walk on the north side of the 236th Street SW bridge over I-5 (the sidewalk is on the north side) until connecting to the planned Lakeview Drive multi-use trail. Pedestrians walking east toward the town center could use the existing sidewalks

along 236th Street SW and 56th Avenue West. Pedestrians could choose to use the trail through Veteran's Memorial Park; however, as a wooded soft trail it is not considered a pedestrian access route to the station. These facilities would all function at LOS A conditions, except for the 5-foot-wide sidewalk on the north side of 236th Street SW across I-5, which is estimated to function at LOS C.

220th Street SW South Station Option (elevated)

Park-and-ride users would walk from the surface lot to the station plaza. The passenger pick-up/drop-off and paratransit areas would be adjacent to the plaza near the north end of the station. Light rail passengers transferring to a bus would use stairs or elevators at the north end of the station and then walk along a pathway to 220th Street SW. Pedestrians going to and from neighborhoods to the southwest would use a walkway at the south end of the station. The walkway would be designed to meet City of Mountlake Terrace standards. During the PM peak hour walkways would function as a LOS A condition.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

Mountlake Terrace Transit Center Station (elevated)

The pedestrian impacts of Alternative B1 would be similar to the Preferred Alternative.

Alternative B2A Modified: East Side to Mountlake Terrace Transit Center to West Side

Mountlake Terrace Transit Center Station (elevated)

The pedestrian impacts of Alternative B2A would be similar to the Preferred Alternative.

220th Street SW Station North Option (elevated)

Park-and-ride users would walk within the garage to stairs and elevators at the southeast end of the parking garage and access the elevated light rail station at the north end of the platform. The passenger pick-up/drop-off areas would be provided on both sides of 220th Street SW near the bus stops. Pick-up/drop-off could also occur within the parking garage. Light rail passengers transferring to a bus would use stairs or elevators on either sides of 220th Street SW and walk along the sidewalks on 220th Street SW. Pedestrians crossing 220th Street SW would use the light rail station platform or the nearest signalized intersection. The sidewalks would be a minimum of 6 feet wide, which is consistent with the City of Mountlake Terrace design guidelines. The sidewalks would function at LOS A conditions.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median**Mountlake Terrace Freeway Station (at-grade in median)**

Light rail passengers walking to the park-and-ride, passenger pick-up/drop-off area, and bus stops would walk on the existing pedestrian bridge that leads to the parking garage. The passenger pick-up/drop-off area would be within the surface lot on the east side of the garage, just as with the existing transit center. Transfers to buses would be the same as currently exists, along the existing internal roadway and on 236th Street SW. Pedestrian paths would be the same as existing conditions.

An additional pedestrian overcrossing of the I-5 northbound lanes would be provided at the north end of the station to 232nd Street SW. ADA-accessible ramps and elevators would be provided to manage the uphill grade.

Segment C: Mountlake Terrace to Lynnwood***No Build Alternative***

Pedestrian facilities in the vicinity of the light rail stations within Segment C are expected to be LOS A or LOS B in 2035 without the project.

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

Park-and-ride users would access the station using stairs or elevators within the parking garage to reach the mezzanine level of the station. From the garage, passengers would use a 20-foot wide pedestrian bridge to the mezzanine level and then use stairs, escalators or elevators to the station plaza. The hourly volume of pedestrians during the PM peak period moving from the station to the garage, as well as pedestrians moving from the garage to the station, would result in LOS D conditions.

The passenger pick-up/drop-off area would be along the northeast edge of the surface parking lot at the south end of the station. Stairs, escalators, or elevators would take light rail passengers to the mezzanine level or station platform. The paratransit load/unload area would be located along the northeast side of this surface parking. This location would provide a short walking distance to the light rail station and bus transit center.

Light rail passengers that transfer to buses would use stairs, escalators, or elevators to access the plaza at the south end of the station and use a crosswalk across the paratransit access roadway. Light rail passengers that access the plaza at the north end of the station could cross 46th Avenue West using a crosswalk. Traffic flow on this section of 46th Avenue West would be limited to buses and carpools; however,

pedestrians would be encouraged via signage to use the south end of the station so that they can cross using the crosswalk across the paratransit access roadway, which would have lower volumes. For purposes of analysis, 75 percent of pedestrians were assumed to use the south end of the station and walk across the plaza to the bus bays and 25 percent were estimated to leave the north end of the station and use the crosswalk to go across 46th Avenue West. The volume of pedestrians is so high that pedestrians could be expected to spread out along the bus bays and traverse the transit center at various locations to arrive at their bus. Pedestrians choosing to use the crosswalks at 46th Avenue West and the transit center driveway would be at LOS F conditions for a 10-foot crosswalk and would also access buses throughout the bus plaza area. Buses and carpools would likely be forced to wait to follow the highest volume of pedestrians.

Pedestrians accessing the station would use existing sidewalks on 48th Avenue West, 46th Avenue West, 200th Street SW, and Alderwood Mall Boulevard. Pedestrians going to and from the southeast would use the existing pedestrian bridge over 44th Avenue West provided by the Interurban Trail and also have access to the parking garage. Pedestrians would walk through the parking garage along a dedicated walkway to the bridge from the parking garage to the station mezzanine. Pedestrians in the vicinity of 200th Street SW/Alderwood Mall Boulevard would walk south along 44th Avenue West and access the plaza. The walkway from the Interurban Trail into the garage would be approximately 12 feet wide, resulting in LOS D conditions. The estimated pedestrian volume on 46th Avenue West would result in LOS D conditions with estimated PM peak pedestrian volume. A 12-foot multi-use path would be provided along the west side of 48th Avenue E for pedestrians accessing the station from the northwest. The extension of the eastbound right turn lane on 200th Street SW would include reconstruction of the sidewalk consistent with City of Lynnwood standards.

Alternative C1: 52nd Avenue West to 200th Street SW

200th Street SW Station (elevated)

Park-and-ride users would walk along either 48th Avenue West or 46th Avenue West to the park-and-ride lots. Pick-up/drop-off passengers would use a platform on the east side of 48th Avenue West, south of the station. Light rail passengers transferring to an eastbound bus would walk from the station platform, down an escalator or stairs, and to the on-street bus stop. Passengers transferring to a westbound bus would cross the east leg of 200th Street SW to the bus stop on the north side of 200th Street SW. Passengers transferring from buses would also continue at the bus bays within the existing transit center through the plaza.

With Alternative C1, park-and-ride users would access lots adjacent to the station and the existing surface lots. Pedestrian access to the surface lots would be through

the station area and transit center or along sidewalks at the perimeter. The highest pedestrian volume, based on a distribution of pedestrians to park-and-ride stalls, would occur at the intersection of 46th Avenue West/48th Avenue West.

Pedestrians were assumed to cross the west leg of the intersection to the surface lots, while pedestrians continuing to the east surface lot would cross the south leg of the intersection. In actual use, pedestrians could be expected to walk diagonally across the intersection due to the high volumes of pedestrians.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

Lynnwood Transit Center Station (elevated)

Park-and-ride users would walk to vertical circulation facilities (stairs, escalators, or elevators) and to the station plazas, and then walk to the south to the parking garage or use the crosswalk across the direct access ramp roadway/46th Avenue West to the existing surface parking lot. The passenger pick-up/drop-off platform would be along the north side of the station plaza along 48th Avenue NE. Light rail passengers that transfer to buses would walk along 48th Avenue West, or between the two parking garage structures to reach the existing bus transit center. The pedestrian LOS would function at LOS C on the two crosswalks between the station area plaza, across 48th Avenue West to the transit center. The concept design shows approximately a 16-foot-wide sidewalk, which would function at LOS C.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Lynnwood Transit Center Station (elevated)

Park-and-ride users would take the stairs, escalators, or elevators to the station plaza and then would have two options for walking to the parking garage just west of the direct access ramp. With Option 1, they would walk along a pedestrian path underneath the direct access ramp to the proposed garage; with Option 2, they would walk up the diagonal pathway to the junction of 46th Avenue West and the direct access ramp and cross the ramp roadway at that point to reach the garage. The diagonal pedestrian path in the concept design is approximately 32 feet wide and would function at LOS E. A wider path would result in a higher LOS rating. The crosswalks at the intersection of 46th Avenue West/48th Avenue West would function at LOS E to LOS F across the south leg. This assumes all pedestrians would use the 12-foot-wide crosswalks. In actual use, pedestrians could be expected to walk diagonally across the intersection.

Light rail passengers who transfer to buses would walk across the intersection of 46th Avenue West/direct access ramp to the existing transit center in Option 1. As a worst-case condition, all pedestrians would use the 12-foot-wide crosswalk, resulting in LOS C conditions. However, pedestrians currently cross at various

locations across 46th Avenue West because it has only bus and HOV traffic and no general purpose traffic. In Option 2, the bus transfer facilities would be located immediately adjacent to the station; hence, light rail passengers would simply walk across the plaza to the buses. Passengers walking to the pick-up/drop-off platform in Option 1 would walk across the plaza. Pedestrian movement would also occur from the plaza area to the Interurban Trail across 46th Avenue West using the intersection crosswalk. In Option 2, pick-up/drop-off passengers would walk along the pedestrian path under the direct access ramp to the platform adjacent to the parking garage.

5.5.2 Bicycle Facilities

Bicycle facilities were inventoried within 1 mile of the proposed light rail stations. The project would increase the number of bicycles in the proposed station areas. Activity centers that would generate an increase in bicycle travel to and from the stations were also included in the analysis, including multifamily housing, commercial areas, community centers, and community colleges. Secure and covered bicycle parking and access would be provided at each station.

Segment A: Seattle to Shoreline

The City of Seattle April 2014 *Seattle Bicycle Master Plan* identifies recommended bicycle facilities in northeast Seattle. A bicycle track (or protected bicycle lanes) is identified for the route using 1st Avenue NE and the North 117th Street bridge, on 5th Avenue NE north of NE 130th Street and along NE 130th Street/NE 125th Street.

The City of Shoreline 2011 *Bicycle System Plan*, *City of Shoreline Transportation Master Plan* identifies recommended bicycle facilities north of NE 145th Street. The City has identified NE 145th Street as an arterial needing further study for all modes of transportation. The *Bicycle System Plan* identifies improvements (described below) in the vicinity of the NE 155th Street Station and the NE 185th Street Station. In addition, the planned improvements are intended to complete bicycle facilities to connect the Interurban Trail to the Burke-Gilman Trail in Lake Forest Park.

At each station option in Segment A, there would be 50 covered bicycle parking spaces provided when Lynnwood Link Extension begins operation, with provision for up to 50 additional bicycle parking spaces in the future.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

Reconstruction of 5th Avenue NE and NE 130th Avenue overcrossing would provide an opportunity to implement protected bike lanes along these reconstructed roadway segments.

NE 145th Street Station (elevated)

A bicycle track would be provided along the frontage of the station, on the west side of 5th Avenue NE, behind the sidewalk. North of NE 145th Street, the City of Shoreline's *Bicycle System Plan* identifies a bicycle lane on 5th Avenue NE; therefore, the reconstructed portion of 5th Avenue NE north of the I-5 on-ramp would be designed to transition to a bicycle lane. Beyond the reconstructed street segments, bicycles would continue to travel in the general purpose lanes. South of NE 145th Street, the City of Seattle *Bicycle Master Plan* shows protected bicycle lanes south to NE 130th Street.

Bicycle parking would be located on the plaza level of the station, and the current concept plan shows three locations at both ends of the plaza.

Bicyclists may choose to use the same route as a vehicle to access the station, or dismount and transition to a pedestrian at the crosswalks, and then access the plaza. The intersections on 5th Avenue NE adjacent to the station are high-volume intersections posing challenges to bicyclists using the same roadway.

Bicyclists approaching the intersection of NE 145th Street and 5th Avenue NE would likely dismount and transition to a pedestrian, walking their bicycle through the crosswalk and onto the plaza. Bicyclists leaving the station would walk their bicycles across the plaza, through the crosswalks, and then mount their bicycles and continue riding in the street. The north leg of this intersection is estimated at an LOS C condition for the PM peak hour of pedestrian volume, which would indicate capacity available for a bicyclist to walk with the bicycle and other pedestrians using the crosswalk.

Bicyclists approaching the station southbound on 5th Avenue NE would enter a bicycle lane near the approach to the I-5 on-ramp, travel with the flow of vehicle traffic through the intersection, and then enter the bicycle track to access the station. This bicycle movement would cross pedestrian movements on the sidewalk; although the volume of pedestrians would be low north of the station. Bicyclists leaving the station to travel north would use the bicycle track, dismount, and use the crosswalk on 5th Avenue NE, and then continue north within the travel lane or shoulder on 5th Avenue NE.

Bicyclists that continue with their bicycles onto the light rail train would either carry their bicycles on the stairs or escalators, or use the elevators. Select rail cars would provide bicycle storage on board.

NE 185th Street Station (at-grade)

Bicycle lanes would be provided along the reconstructed portion of NE 185th Street adjacent to the light rail station; on the existing NE 185th Street bridge that would be reconfigured to provide bicycle lanes; and adjacent to the park-and-ride—all of which would be consistent with the City of Shoreline's *Bicycle System Plan*. Beyond the reconstructed segment, bicycles would travel with general purpose traffic until reaching existing bicycle lanes. The bicycle facility inventory reveals that there would be a gap in the bicycle lane on NE 185th Street between reconstructed 5th Avenue NE on the west side of I-5 and the existing bicycle lane that extends west of 1st Avenue North. Another gap would occur on NE 185th Street east of the reconstructed portion of NE 185th Street and 10th Avenue NE. 10th Avenue NE has an existing 6-foot-wide paved shoulder and is designated as a sharrows lane in the City of Shoreline's *Bicycle System Plan*.

Two segments of 5th Avenue NE (north of NE 185th Street and west of I-5, and east of I-5 and to the south of NE 185th Street) would be reconstructed with bicycle lanes consistent with the City of Shoreline's *Bicycle System Plan*. Beyond the reconstructed street segments of 5th Avenue NE, bicyclists would continue to travel in the general purpose lanes.

Bicycle parking would be located on the plaza level of the station. Bicyclists would enter the station as pedestrians, walking their bicycles, at the southeast corner of the plaza. For bicyclists traveling from the east, westbound on NE 185th Street, riders would travel on the street and then dismount at the southeast corner of the plaza. Bicyclists traveling from the west, eastbound on NE 185th Street, would dismount near 5th Avenue NE and use the crosswalk on the west leg of NE 185th Street to access the southeast corner of the plaza. Alternatively, bicyclists from the City of Shoreline recreation facilities could use the bicycle and pedestrian bridge. The northbound bicyclists from 5th Avenue NE would dismount at NE 185th Street, use the crosswalks across 5th Avenue NE and the west leg of NE 185th Street, and walk onto the plaza in the southeast corner.

Bicyclists that continue with their bicycles onto the light rail train would either carry their bicycles on the stairs or escalators or use the elevators. Select rail cars would provide bicycle storage on board.

Bicyclists leaving the station would similarly walk their bicycles to the southeast corner of the plaza, use the crosswalks as pedestrians, and then mount their bicycles to begin riding on the street.

Optional Shoreline Stadium Garage

Bicyclists would travel within bicycle lanes on NE 185th Street to and from the stadium garage.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station Option 1 (elevated)

With Alternative A1, NE 145th Street would be reconstructed to City of Seattle and/or City of Shoreline standards. The reconstructed portion of 5th Avenue NE south of NE 145th Street would include protected bicycle lanes consistent with the City of Seattle's *Bicycle Master Plan*. North of NE 145th Street, the *Bicycle System Plan* identifies a bicycle lane on 5th Avenue NE; therefore, the reconstructed portion of 5th Avenue NE north of NE 145th Street would also include a bicycle lane. Beyond the reconstructed street segments, bicycles would continue to travel in the general purpose lanes.

NE 185th Street Station Option 1 (at-grade)

The reconstructed portion of NE 185th Street between the west side of the reconstructed 5th Avenue NE west of I-5, including the east side of the reconstructed 5th Avenue NE on the east side of I-5, would have bicycle lanes consistent with the City of Shoreline's *Bicycle System Plan*. Beyond the reconstructed segment, bicycles would travel with general purpose traffic until reaching existing bicycle lanes. The bicycle facility inventory reveals that there would be a gap in the bicycle lane on NE 185th Street between reconstructed 5th Avenue NE on the west side of I-5 and the existing bicycle lane that extends west of 1st Avenue North. Another gap would occur on NE 185th Street east of the reconstructed portion of NE 185th Street between 5th Avenue NE (west of I-5) and 10th Avenue NE. 10th Avenue NE has an existing 6-foot-wide paved shoulder and is designated as a sharrows lane in the City of Shoreline's *Bicycle System Plan*.

Two segments of 5th Avenue NE (north of NE 185th Street and west of I-5, and east of I-5 and to the south of NE 185th Street) would be reconstructed with bicycle lanes consistent with the City of Shoreline's *Bicycle System Plan*. Beyond the reconstructed street segments of 5th Avenue NE, bicycles would continue to travel in the general purpose lanes.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

NE 145th Street Station Option 2 (elevated)

The impacts of Option 2 with Alternative A3 would be the same as Option 1 described above for Alternative A1.

NE 185th Street Station Option 2 (elevated)

With Alternative A3, the impacts of Option 2 would be the same as Option 1 with Alternative A1, except that the reconstructed portion of NE 185th Street would end east of I-5, and 5th Avenue NE would not be reconstructed on either the west or east side of I-5; therefore, they would not have bicycle facilities. Bicycles would continue to travel in the general purpose lanes between the east end of the I-5 bridge and 1st Avenue NE to the existing bicycle lanes on NE 185th Street west of 1st Avenue NE.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

NE 130th Street Station Option 1 (at-grade)

The reconstructed portion of NE 130th Street would include protected bicycle lanes as the design progresses. Beyond the reconstructed segment, bicyclists would continue to travel in general purpose lanes on NE 130th Street west of I-5, and east along NE 130th Street and Roosevelt Way NE to NE 125th Street.

The reconstructed portion of 5th Avenue NE has not yet been designed to include the bicycle track or protected lane that would be consistent with the City of Seattle's *Bicycle Master Plan*. Beyond the reconstructed segment, bicycles would travel with general purpose traffic along curbed segments and on the paved shoulder north of the station area.

NE 155th Street Station (elevated)

The reconstructed portion of NE 155th Street would replace the existing bicycle lanes, consistent with the City of Shoreline's *Bicycle System Plan*. Beyond the reconstructed portion of NE 155th Street to the east of 5th Avenue NE, bicycles would continue to use the general purpose lanes.

NE 185th Street Station Option 3 (at-grade)

The impacts of the NE 185th Street Station Option 3 with Alternative A5 would be the same as Option 2 with Alternative A3.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations**NE 130th Street Station Option 2 (elevated)**

The impacts of the NE 130th Street Station Option 2 with Alternative A7 would be the same as Option 1 with Alternative A1, except that the NE 130th Street bridge would not be reconstructed. Bicycles would continue to travel in general purpose lanes over the NE 130th Street bridge to the west.

NE 155th Street Station (elevated)

The impact of the NE 155th Street Station with Alternative A7 would be the same as with Alternative A5.

NE 185th Street Station Option 2 (elevated)

The impact of the NE 185th Street Station with Alternative A7 would be the same as with Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations**NE 130th Street Station Option 1 (at-grade)**

The impact of the NE 130th Street Station with Alternative A10 would be the same as with Alternative A5.

NE 145th Street Station Option 1 (elevated)

The impact of the NE 145th Street Station with Alternative A10 would be the same as with Alternative A1.

NE 185th Street Station Option 3 (at-grade)

The impact of the NE 185th Street Station with Alternative A10 would be the same as with Alternative A5.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations**NE 130th Street Station (elevated)**

The impact of the NE 130th Street Station with Alternative A11 would be the same as with Alternative A7.

NE 145th Street Station Option 2 (elevated)

The impact of the NE 145th Street Station with Alternative A11 would be the same as the Preferred Alternative.

NE 185th Street Station Option 2 (elevated)

The impact of the NE 185th Street Station with Alternative A11 would be the same as with Alternative A3.

Segment B: Shoreline to Mountlake Terrace

The NE 195th Street pedestrian and bicycle bridge over I-5 would be reconstructed with all Segment B alternatives. The facility would be constructed to meet or exceed WSDOT and local jurisdiction standards. The current concept design is 14 feet wide.

At each station option in Segment B, there would be 50 covered bicycle parking spaces provided when the stations open and space to provide up to 50 additional bicycle parking spaces in the future.

Preferred Alternative: East Side to Mountlake Terrace Transit Center to West Side

Mountlake Terrace Transit Center Station (elevated)

The reconstructed portion of 236th Street SW would include bicycle lanes consistent with the Bike Route Facility Recommendations, Future Bicycle Plan in the City of Mountlake Terrace 2007 *Mountlake Terrace Transportation Master Plan*. Bicyclists approaching the station from the west, traveling east, could travel as a vehicle and use the left-turn lane to enter the station at the main access. Bicyclists could also continue across the I-5 off ramp, disembark at the corner, and walk to the bicycle parking area on the plaza. Bicyclists leaving the station, traveling west, would use the general purpose lanes on the 236th Street bridge over I-5 and then connect to the multi-use trail along Lakeview Drive. The Lakeview Trail, a mixed-use paved trail, is currently under design and will be located on the north side of 236th Street SW west of the I-5 southbound ramp.

Bicyclists approaching the station from the east and traveling west would access the sidewalk at the back of the bus bay, disembark, and walk to the bicycle parking area on the plaza. Bicyclists leaving the station eastbound would enter the bicycle lane in front of the bus bay. East of the reconstructed portion of 236th Street SW bicyclists would continue to ride in the general purpose lanes.

Bicyclists that continue with their bicycles onto the light rail train would either carry their bicycles on the stairs or escalators, or use the elevators. Select rail cars would provide bicycle storage on board.

220th Street SW Station South Option (elevated)

Bicyclists would access the 220th Street SW Station from a path between 220th Street SW and the station, and a path connecting 222nd Street SW and the station. Bicycle parking would be provided on the station plaza.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median**Mountlake Terrace Transit Center Station (elevated)**

The reconstructed portion of 236th Street SW would include bicycle lanes consistent with the Bike Route Facility Recommendations, Future Bicycle Plan in the City of Mountlake Terrace 2007 *Mountlake Terrace Transportation Master Plan*. Traveling west from the station, bicyclists would continue to use the general purpose lanes on the 236th Street SW bridge over I-5 and then connect to the multi-use trail along Lakeview Drive. The Lakeview Trail, a mixed-use paved trail, is currently under design and will be located on the north side of 236th Street SW west of the I-5 southbound ramp.

East of the reconstructed portion of 236th Street SW, bicyclists would continue to ride in the general purpose lanes.

Alternative B2A Modified: East Side to Mountlake Terrace Transit Center to West Side**Mountlake Terrace Transit Center Station (elevated)**

The impacts to bicycle travel would be similar to the Preferred Alternative.

220th Street SW Station North Option (elevated)

With Alternative B2A, bicyclists would access the 220th Street SW Station parking garage from the driveway entrance at 60th Avenue West, or by using the elevators on either side of 220th Street SW. Bicyclists would then walk their bicycles through the station to the garage. Bicycle enhancements could be designed to facilitate the movement of bicycles from 220th Street SW to the station elevators to avoid the additional travel distance to 60th Avenue West for some bicyclists. There would be no designated bicycle facilities in this station area except at the Interurban Trail, which is located approximately 0.50 mile to the west and north of the station location.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

Mountlake Terrace Freeway Station (at-grade)

There would be no effect on bicycles with Alternative B4 because all construction activity would be in the median of I-5. Bicyclists would continue to access the transit center from 236th Street SW, use existing bicycle parking, and then walk to the freeway station.

Segment C: Mountlake Terrace to Lynnwood

At each station option in Segment C, there would be 200 covered bicycle parking spaces provided when the station opens and space to provide up to 200 additional bicycle parking spaces in the future. The multi-use Interurban Trail passes by all station alternatives in this segment, providing bicycle access to the north and south of the stations.

Within 1 mile of the proposed light rail station, the City of Lynnwood planned “Bicycle Skeleton System” in their Comprehensive Plan includes 5-foot-wide bicycle lanes on all arterials except 196th Street SW and 44th Avenue West south of 194th Street SW. In addition, improvements to the Interurban Trail are planned in the vicinity of 200th Street SW and 52nd Avenue West.

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

Bicyclists accessing the station from 48th Avenue West would use the paratransit roadway, dismount at the plaza, park their bicycles, and access the station at the south end. Bicyclists leaving the station toward 48th Avenue West would walk with their bicycles across the crosswalk, then mount their bicycles to travel west on the paratransit roadway. This crosswalk and intersection would have a high volume of pedestrians during the PM peak period.

Bicyclists accessing the station from 46th Avenue West would travel as a vehicle to the crosswalk across 46th Avenue West, dismount, and use the crosswalk across 46th Avenue West. These bicyclists would increase the volume of pedestrians conflicting with the bus and carpool traffic on 46th Avenue West. Bicyclists might prefer to park their bicycles on the plaza on the east side of 46th Avenue West so that when they are leaving the station they can walk their bicycles to the edge of the plaza and then begin riding on 46th Avenue West, which is north of the major pedestrian volume that occurs between the station and the transit center.

Bicyclists accessing the station from 44th Avenue West would travel as a vehicle to a walkway that connects to the Interurban Trail. The path from the Interurban Trail to the park-and-ride garage would be approximately 12 feet wide and would have

mixed pedestrians and bicycles. During periods of high pedestrian volumes bicyclist could be required to dismount prior to entering the garage or dismount at the garage entrance. Bicycle parking would be located near the entrance. Leaving the station, bicyclists would use the Interurban Trail bridge over 44th Avenue West and either access 44th Avenue West to the north traveling in the general purpose lane or access the Interurban Trail.

Bicyclists approaching the station from the south, traveling north on 44th Avenue West, would use the Interurban Trail bridge and then the access the station via the park-and-ride garage or continue north and access the plaza.

Bicyclists that continue with their bicycles onto the light rail train would either carry their bicycles on the stairs or escalators, or use the elevators. Select rail cars would provide bicycle storage on board.

Alternative C1: 52nd Avenue West to 200th Street SW

Alternative C1 would result in reconstruction of portions of the east side of 52nd Avenue West in the vicinity of the on-street portion of the Interurban Trail and on Cedar Valley Road. Reconstruction would include replacement of the existing bicycle lanes. There is a programmed improvement to the Interurban Trail in the vicinity of 208th Street SW and 52nd Avenue West. This constructed improvement would remain in place following construction of the light rail line.

200th Street Station SW Station

The reconstructed segment of 200th Street SW would include bicycle lanes consistent with the City of Lynnwood's Comprehensive Plan. The reconstructed segment extends from approximately 335 feet west of 48th Avenue West to 46th Avenue West on the south side of 200th Street SW. There could be a gap in the bicycle lane route on the south side of 200th Street SW between the west end of the reconstructed portion to the existing bicycle lanes at 50th Avenue West. The reconstruction would not include the north side of 200th Street SW.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

There is a segment of Alternative C2 that would result in reconstruction of portions of the east side of 52nd Avenue West in the vicinity of the on-street portion of the Interurban Trail. Reconstruction would include replacement of the existing bicycle lanes. There is a programmed improvement to the Interurban Trail in the vicinity of 208th Street SW and 52nd Avenue West. This constructed improvement would remain in place after construction of the light rail line.

Lynnwood Transit Center Station

The tail tracks at the Lynnwood Transit Center Station would be over the Interurban Trail and the ramp to the 44th Street West pedestrian/bicycle bridge. Both facilities would remain in place after construction of Alternative C2.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

The Alternative C3 light rail line would cross over the Interurban Trail east of 208th Street West and 48th Avenue West. A segment of the light rail line would result in reconstruction of portions of the east side of 52nd Avenue West in the vicinity of the on-street portion of the Interurban Trail. Reconstruction would include replacement of the existing bicycle lanes. There is a programmed improvement to the Interurban Trail in the vicinity of 208th Street SW and 52nd Avenue West. This constructed improvement would remain in place following construction of the light rail line.

Lynnwood Park-and-Ride Station

The tail tracks at the Lynnwood Transit Center Station would be over the Interurban Trail and the ramp to the 44th Street West pedestrian/bicycle bridge. Both facilities would remain in place after construction of Alternative C3.

5.6 Freight Mobility and Access

No changes to freight mobility and access are expected with the No Build Alternative beyond the increases in delay and roadway congestion that could occur over time.

With the Preferred Alternative and other light rail alternatives, freight truck traffic is expected to continue using the designated FGTS and city streets for the movement of freight. In some locations, designated truck routes would travel alongside the at-grade light rail alignment. At these locations, roadway and intersection conditions with the light rail alternatives would be similar to those with the No Build Alternative. Some intersection operations may improve through mitigation for the project alternatives, which could benefit freight movement. Beyond these potential project effects, modifications to the roadway network associated with the project alternatives that could result in changes in freight mobility and access are described for each segment. These modifications are not anticipated to negatively affect truck circulation or change the truck route designations on the regional and local street network.

Key observations and findings related to freight traffic include the following:

- In Segment A, some I-5 access modifications would be made near NE 130th Street with the Preferred Alternative and Alternatives A1, A5, and A10, and at the NE 145th Street Station with Alternatives A3 and A11. However,

these modifications are not expected to result in negative effects on truck circulation.

- In Segment A, NE 145th Street is a truck route serving freight traffic between I-5 and commercial activities to the west and east. Any increased queuing at the I-5 interchange ramps or other NE 145th Street intersections would be mitigated to prevent adverse effects on freight movement.
- The Segment B and C alternatives are not expected to affect truck circulation.

Segment A: Seattle to Shoreline

The Segment A alternatives are not expected to result in negative effects on truck circulation and not expected to affect any freight routes identified by the FGTS or the Cities of Seattle and Shoreline. Some I-5 access modifications would be made near NE 130th Street with the Preferred Alternative and Alternatives A1, A5, and A10, and at the NE 145th Street Station with Alternatives A3 and A11. An interchange justification report (IJR) is required for these ramp modifications with approval from WSDOT and FHWA. All alternatives would extend from the Northgate Station to the north side of NE 185th Street.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

The Preferred Alternative begins at the Northgate Station and continues north in a mix of elevated and at-grade profiles on the east side of I-5, with an elevated station at NE 145th Street and an at-grade station at NE 185th Street.

Near NE 130th Street, the I-5 northbound off-ramp would be relocated to the south and would be grade-separated from southbound 5th Avenue NE, which would be below the off-ramp. The NE 130th Street bridge over I-5 would be rebuilt and realigned slightly to the south. This access modification may result in slightly improved freight access between I-5 and NE 130th Street.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

Freight mobility and access impacts for Alternative A1 would be similar to the Preferred Alternative.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

Alternative A3 is similar to the Preferred Alternative, but would be mostly elevated between the Northgate Station and NE 145th Street. North of NE 145th Street, the

alignment would continue in a mix of elevated and at-grade profiles to an elevated station at NE 185th Street.

At the NE 145th Street Station, the northbound on-ramp to I-5 would be relocated to approximately the north edge of the existing surface park-and-ride lot to accommodate a new parking garage south of the relocated ramp. This would result in a modification to freight access between NE 145th Street/5th Avenue NE and I-5.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Alternative A5 also begins at the Northgate Station and continues north in a mix of elevated and at-grade profiles on the east side of I-5 to an at-grade station at NE 130th Street. North of the NE 130th Street Station, the alignment continues north in a predominantly at-grade profile on the east side of I-5 to an elevated station at NE 155th Street. The alignment then continues north in a predominantly at-grade profile to an at-grade station at NE 185th Street.

Near NE 130th Street, the I-5 northbound off-ramp would be relocated to the south and would be grade-separated from southbound 5th Avenue NE, which would be below the off-ramp. The NE 130th Street bridge over I-5 would be rebuilt and realigned slightly to the south. This access modification may result in slightly improved freight access between I-5 and NE 130th Street.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Alternative A7 is similar to Alternative A5, but with a mostly elevated alignment to NE 145th Street. Elevated stations would be provided at NE 130th Street, NE 155th Street, and NE 185th Street.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Similar to Alternative A5, Alternative A10 begins at the Northgate Station and continues north in a mix of elevated and at-grade profiles on the east side of I-5 to an at-grade station at NE 130th Street. North of NE 130th Street, the alignment would continue on the east side of I-5 in a predominantly at-grade profile, with short sections of elevated guideway (similar to Alternative A1). An elevated station would be provided at NE 145th Street and an at-grade station at NE 185th Street.

As with Alternative A5, the I-5 northbound off-ramp near NE 130th Street would be relocated to the south and would be grade-separated from southbound 5th Avenue NE, which would be below the off-ramp. The NE 130th Street bridge over I-5 would be rebuilt and realigned slightly to the south. This access modification may result in slightly improved freight access between I-5 and NE 130th Street.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Similar to Alternative A7, Alternative A11 follows the east side of I-5 from the Northgate Station in a mostly elevated alignment to NE 145th Street. Elevated stations would be provided at NE 130th Street, NE 145th Street, and NE 185th Street.

As with Alternative A3, the I-5 northbound on-ramp adjacent to the NE 145th Street Station would be relocated to approximately the northern edge of the existing surface park-and-ride lot to accommodate a new parking garage south of the relocated ramp. This would result in a modification to freight access between NE 145th Street/5th Avenue NE and I-5.

Segment B: Shoreline to Mountlake Terrace

The Segment B alignment alternatives are not expected to affect truck circulation or truck routes identified by the FGTS and the Cities of Shoreline and Mountlake Terrace. All alternatives would extend from the north end of the NE 185th Street Station to approximately 212th Street SW.

Preferred Alternative (B2 Modified): East Side to Mountlake Terrace Transit Center to West Side

The Preferred Alternative extends north from the NE 185th Street Station in a mix of elevated and at-grade profiles on the east side of I-5 to an elevated Mountlake Terrace Transit Center Station at 236th Street SW. North of the Mountlake Terrace Transit Center Station, the alignment continues north on an elevated guideway, crossing over I-5 to the west side. The alignment then continues north in a mix of at-grade and elevated profiles until south of 220th Street SW where it continues north with an elevated profile to approximately 212th Street SW.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

Alternative B1 is the same as the Preferred Alternative between the NE 185th Street Station and the north side of the elevated Mountlake Terrace Transit Center Station. North of the Mountlake Terrace Transit Center Station, the alignment would continue north on an elevated guideway, cross over the northbound lanes of I-5, and continue north at-grade in the median of I-5 to approximately 212th Street SW.

Alternative B2A: Optional 220th Street SW Station (elevated)

An optional elevated station at 220th Street SW would be provided with Alternative B2A.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

Similar to Alternative B1, the Alternative B4 alignment continues north from the NE 185th Street Station in a mix of elevated and at-grade profiles on the east side of I-5 to approximately 239th Street SW. The alignment would then cross over northbound I-5 to an at-grade Mountlake Terrace Freeway Station. North of the Mountlake Terrace Freeway Station, the alignment would continue north at-grade in the I-5 median to approximately 212th Street SW.

Segment C: Mountlake Terrace to Lynnwood

The Segment C alignment alternatives are not expected to affect truck circulation or truck routes identified by the FGTS or the City of Lynnwood. All alternatives would extend from the north end of the NE 185th Street Station to approximately 212th Street SW.

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

The Preferred Alternative alignment continues along I-5 in the median or elevated on the west side of I-5 to approximately 208th Street SW, where the alignment leaves the I-5 right-of-way and turns to the north. The alignment then crosses the Interurban right-of-way and parallels I-5 to the elevated Lynnwood Park-and-Ride Station located on the east side of the existing Lynnwood direct access ramp. The elevated guideway of the Preferred Alternative would require columns that may affect the location and operation of driveways and parking lot circulation where light industrial properties would take truck deliveries. This impact could be mitigated in the design process.

Alternative C1: 52nd Avenue West to 200th Street SW

The Alternative C1 alignment continues northbound either at-grade in the median or elevated on the west side of I-5 and leaves the I-5 right-of-way at approximately 210th Street SW. The alignment then turns to the north and continues in an elevated profile along the east side of 52nd Avenue West, turns to the northeast along the east side of Cedar Valley Road, and then turns east along the south side of 200th Street SW, arriving at the elevated Lynnwood 200th Street SW Station on the east side of 48th Avenue West. The elevated guideway of Alternative C1 would require columns that may affect the location and operation of driveways along the east side of 52nd Avenue West and Cedar Valley Road where light industrial properties would take truck deliveries. This impact could be mitigated in the design process.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

The Alternative C2 alignment is the same as the Alternative C1 alignment until approximately 204th Street SW, where the elevated alignment turns to the northeast and continues north to the elevated Lynnwood Transit Center Station. The elevated guideway of Alternative C2 would require columns that may affect the location and operation of driveways along the east side of 52nd Avenue West where light industrial properties would take truck deliveries. This impact could be mitigated in the design process.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Freight mobility and access impacts for Alternative C3 would be similar to the Preferred Alternative.

5.7 Parking

The Lynnwood Link Extension stations would include new, replacement, and additional park-and-ride capacity. The additional park-and-ride lots are proposed near most stations based on anticipated parking demand. These park-and-ride lots have generally been sized to accommodate the forecasted parking demand. However, there could be some parking spillover at stations if the vehicle demand exceeds park-and-ride capacity, or if users park on the street based on perceived convenience, particularly at the NE 130th Street Station, where limited new parking supply is proposed.

At the NE 145th Street, NE 155th Street, and NE 185th Street stations, there is currently a relatively large amount of unrestricted on-street parking in the vicinity of the stations; however, the potential for spillover parking is anticipated to be low due to the relatively large proposed supply of park-and-ride parking. In station areas that currently lack available on-street parking supply, such as near the Lynnwood, 220th Street SW, and Mountlake Terrace station options, the potential for “hide-and-ride” parking activity (i.e., on-street parking by transit users in neighborhoods surrounding stations) would be limited. In these cases, if spillover parking occurred, it would likely be on privately owned off-street parking facilities.

The amount of parking provided at each station may be further refined in future phases of the project. The available parking analyzed for the EIS is the higher range of expected park-and-ride supply in order to assess the likely highest level of effects. At some station areas, the street reconstruction adjacent to the light rail station would permanently remove on-street parking. Parking impacts and proposed park-and-ride parking spaces for each segment and alternative are described below. As part of this analysis, Sound Transit considered parking supply within 0.25 mile of each proposed station. Refer to Section 4.7, Parking, in Chapter 4 for figures showing the area inventoried for each proposed station.

Key observations and findings related to parking include the following:

- For all segments, park-and-ride capacity has been sized to generally accommodate the forecasted parking demand under typical situations. Some parking spillover could occur at stations if the vehicle demand exceeds park-and-ride capacity, or if users park on the street based on perceived convenience.
- In Segment A, the light rail alternatives would result in a loss of between 69 and 96 on-street parking spaces, and no loss of off-street parking.
- In Segment B, the light rail alternatives would result in a loss of between zero and 11 on-street parking spaces, and no loss of off-street parking.
- In Segment C, the light rail alternatives would result in a loss of between zero and eight off-street parking spaces, and no loss of on-street parking.

Segment A: Seattle to Shoreline

Table 5-34 summarizes the parking impacts along Segment A by alternative for on-street parking and off-street parking. The data in Table 5-34 do not include the existing park-and-ride lots and any off-street parking spaces associated with properties that might be acquired by the project. This loss of this parking is not considered a parking impact because the parking need also has been removed by the project. Parking at the Latvian Evangelical Lutheran Church will be modified but parking supply will be maintained. The Preferred Alternative would result in a loss of 69 parking spaces, while the loss with the remaining alternatives ranges from 73 to 96 spaces.

Table 5-34. Segment A Parking Impacts

Alternative	Parking Spaces Removed ^a		
	On-Street	Off-Street ^b	Total
Preferred Alternative	69	0	69
Preferred Alternative with options	69	0	69
Alternative A1	69	0	69
Alternative A3	73	0	73
Alternative A5	89	0	89
Alternative A7	77	0	77
Alternative A10	96	0	96
Alternative A11	84	0	84

^a Includes parking spaces removed for column placement where applicable.

^b Off-street does not include park-and-ride spaces.

Table 5-35 shows the park-and-ride lot spaces removed and proposed new park-and-ride spaces at each station and by alternative.

Table 5-35. Segment A Park-and-Ride Impacts and Proposed New Parking Spaces

Station	Alternative	Total Existing Parking Spaces	Removed Parking Spaces ^a	Proposed New Parking Spaces	Parking Spaces after project	Net Change in Parking Spaces
NE 130th Street Station—Option 1, with park-and-ride	Preferred Alternative with options, A5	46	46	100 ^b	100 ^b	54
NE 130th Street Station—Option 1, no park-and-ride	A10	46	46	0	0	-46
NE 130th Street Station—Option 2	A7, A11	46	4	100	142	96
NE 145th Street Station—Option 1	A1	68	68	500	500	432
NE 145th Street Station—Option 1	A10	68	68	650	650	582
NE 145th Street Station—Option 2	Preferred Alternative, A3, A11	68	68	500	500	432
NE 155th Street Station	A5, A7	0	0	500	500	500
NE 185th Street Station—Options 1 and 2	Preferred Alternative, A1, A3, A7, A11	0	0	500	500	500
NE 185th Street Station—Option 3	A5, A10	0	0	350	350	350

^a Includes parking spaces removed for column placement where applicable.

^b Possible surface parking lot available for lease located adjacent to the station.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Stations

Parking Impacts along the Light Rail Alignment

There could be approximately 12 on-street parking spaces removed along the Preferred Alternative light rail alignment.

The NE 133rd/5th Avenue NE Park-and-Ride, with 46 spaces, located to the north of NE 130th Street along 5th Avenue NE, would also be removed with construction of the alignment. The demand for park-and-ride space would shift to the NE 145th Street Station with the Preferred Alternative.

NE 145th Street Station Impacts

At the NE 145th Street Station, 17 on-street parking spaces would be removed along NE 148th Street, relative to the 450 on-street parking spaces within 0.25 mile of the proposed station. The existing North Jackson Park Park-and-Ride lot would be

removed and replaced by a park-and-ride garage with 500 spaces, resulting in 432 additional park-and-ride spaces.

NE 185th Street Station Impacts

At the NE 185th Street Station, approximately 40 on-street parking spaces would be removed along 7th Avenue NE and NE 185th Street, relative to 700 on-street parking spaces within 0.25 mile of the proposed station. A park-and-ride garage with 500 spaces is proposed for the Preferred Alternative and would be located on the west side of I-5 north of NE 185th Street.

Preferred Alternative with Options: At-grade/Elevated with NE 130th, NE 145th and NE 185th Stations

Parking Impacts along the Light Rail Alignment

Parking impacts along the alignment would be the same as with the Preferred Alternative

NE 130th Street Station Option 1

Approximately 11 on-street parking spaces would be removed along 5th Avenue NE relative to 430 on-street parking spaces within 0.25 mile of the proposed NE 130th Street Station Option 1.

The existing NE 133rd/5th Avenue NE Park-and-Ride lot would be removed, resulting in a loss of 46 parking spaces. A park-and-ride lot with up to 100 spaces may be leased from a property located on 5th Avenue NE across the street from the proposed station location, resulting in up to 54 additional park-and-ride spaces. Other nearby leased parking options could also be investigated

NE 145th Street Station Option 1

Parking impacts at the NE 145th Street Station would be the same as with the Preferred Alternative.

NE 185th Street Station Option 1

Parking impacts at the NE 185th Street Station would be the same as with the Preferred Alternative.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Stations**Parking Impacts along the Light Rail Alignment**

Parking impacts along the Alternative A1 alignment would be approximately the same as with the Preferred Alternative.

NE 145th Street Station Option 1

Parking impacts with Alternative A1 at the NE 145th Street Station would be approximately the same as with the Preferred Alternative.

NE 185th Street Station Option 1

Parking impacts with Alternative A1 at the NE 185th Street Station would be approximately the same as with the Preferred Alternative.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations**Parking Impacts along the Light Rail Alignment**

A few parking spaces would be removed at the existing NE 133rd/5th Avenue NE Park-and-Ride lot, located north of NE 130th Street on 5th Avenue NE, due to the column placement for the Alternative A3 elevated guideway.

NE 145th Street Station Option 2

Parking impacts with Alternative A3 would be approximately the same as with the Preferred Alternative.

NE 185th Street Station Option 2

Approximately 56 on-street parking spaces would be removed along 7th Avenue NE, 8th Avenue NE, and NE 185th Street relative to 700 on-street parking spaces within 0.25 mile of the proposed NE 185th Street Station.

A park-and-ride garage with 500 spaces is proposed for Alternative A3 and would be located on 8th Avenue NE.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations***Parking Impacts along the Light Rail Alignment***

Parking impacts along the Alternative A5 alignment would be approximately the same as with the Preferred Alternative.

NE 130th Street Station Option 1

Parking impacts with Alternative A5 would be approximately the same as with the Preferred Alternative with Options.

NE 155th Street Station

Approximately 10 on-street parking spaces would be removed on NE 155th Street relative to 580 on-street parking spaces within 0.25 mile of the proposed station. A park-and-ride garage with 500 spaces would be added at the station to accommodate light rail users.

NE 185th Street Station Option 3

Approximately 56 on-street parking spaces would be removed along 7th Avenue NE, 8th Avenue NE, and NE 185th Street relative to 700 on-street parking spaces within 0.25 mile of the proposed NE 185th Street Station.

Two surface park-and-ride lots are proposed for this station with Alternative A5: one with 158 spaces located at the station and the other with up to 205 spaces located east of 8th Avenue NE.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Parking Impacts along the Light Rail Alignment

Parking impacts along the Alternative A7 alignment would be approximately the same as with Alternative A3.

NE 130th Street Station Option 2

Approximately 11 on-street parking spaces would be removed along 5th Avenue NE relative to 430 on-street parking spaces within 0.25 mile of the proposed NE 130th Street Station.

A new surface park-and-ride lot with 100 spaces would be provided north of the station on 5th Avenue NE with Alternative A7.

NE 155th Street Station

Parking impacts with Alternative A7 would be approximately the same as with Alternative A5.

NE 185th Street Station Option 2

Parking impacts with Alternative A7 would be approximately the same as with Alternative A3.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations**Parking Impacts along the Light Rail Alignment**

Parking impacts along the Alternative A10 alignment would be approximately the same as with Alternatives A1 and A5.

NE 130th Street Station Option 1 with no parking

Approximately 11 on-street parking spaces would be removed along 5th Avenue NE relative to 430 on-street parking spaces within 0.25 mile of the proposed NE 130th Street Station Option 1.

The existing NE 133rd/5th Avenue NE Park-and-Ride lot would be removed, resulting in a loss of 46 parking spaces.

NE 145th Street Station Option 1

Parking impacts with Alternative A10 would be similar to the Preferred Alternative, except the existing North Jackson Park Park-and-Ride lot would be removed and replaced by a park-and-ride garage with 650 spaces, resulting in 582 additional park-and-ride spaces.

NE 185th Street Station Option 3

Parking impacts with Alternative A10 would be approximately the same as with Alternative A5.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations**Parking Impacts along the Light Rail Alignment**

Parking impacts along the Alternative A11 alignment would be approximately the same as with Alternatives A3 and A7.

NE 130th Street Station Option 2

Parking impacts with Alternative A11 would be approximately the same as with Alternative A7.

NE 145th Street Station Option 2

Parking impacts with Alternative A11 would be approximately the same as with Alternative A3.

NE 185th Street Station Option 2

Parking impacts with Alternative A11 would be approximately the same as with Alternatives A3 and A7.

Segment B: Shoreline to Mountlake Terrace

Table 5-36 summarizes the parking impacts along the Segment B alignment by alternative, not including the existing park-and-ride lots. Approximately 11 on-street parking spaces could be lost with Alternative B2A. This parking loss would primarily be in the vicinity of 220th Street SW. There would be no loss of off-street parking due to the alignments.

Table 5-36. Segment B Parking Impacts

Alternative	Parking Spaces Removed		
	On-Street	Off-Street ^a	Total
Preferred Alternative (B2 Modified)	0	0	0
Preferred Alternative (B2 Modified) with options	0	0	0
Alternative B1	0	0	0
Alternative B2A	11	0	11
Alternative B4	0	0	0

^a Off-street does not include park-and-ride spaces.

Table 5-37 shows the proposed change in park-and-ride capacity at stations with each alternative. There are no changes to the existing Mountlake Terrace Park-and-Ride lot with Segment B alternatives.

Table 5-37. Segment B Park-and-Ride Impacts and Proposed New Parking Spaces

Station	Alternative	Total Existing Parking Spaces	Removed Parking Spaces	Proposed New Parking Spaces	Parking Spaces after Project	Net Change in Parking Spaces
Mountlake Terrace Transit Center Station	B1, Preferred Alternative, B2A	880	0	0	880	0
Mountlake Terrace Transit Center Station	B1 with options	880	220	500	1160	280
Mountlake Terrace Freeway Station	B4	880	0	0	880	0
220th Street SW Station	Preferred Alternative with Options, B2A	0	0	200	200	200

Preferred Alternative (B2 Modified): East Side to Mountlake Terrace Transit Center to West Side**Mountlake Terrace Transit Center Station**

With the Preferred Alternative, there would be no impacts to on-street parking, off-street parking, or to the park-and-ride lot spaces at the Mountlake Terrace Transit Center Station.

Preferred Alternative (B2 Modified) with Options: East Side to Mountlake Terrace Transit Center to West Side**Mountlake Terrace Transit Center Station**

Similar to the Preferred Alternative, there would be no impacts to on-street parking, off-street parking, or to the park-and-ride lot spaces at the Mountlake Terrace Transit Center Station.

Optional 220th Street SW Station

There would be no loss of on-street parking with the optional 220th Street SW Station.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median**Mountlake Terrace Transit Center Station**

With Alternative B1, there would be no impacts to on-street parking, off-street parking, or to the park-and-ride lot spaces at the Mountlake Terrace Transit Center Station.

Alternative B1 with Options: East Side to Mountlake Terrace Transit Center to Median**Mountlake Terrace Transit Center Station**

With Alternative B1 with options, the existing surface parking lot would be converted to a parking garage that could accommodate up to 500 park-and-ride spaces. This would result in a net gain of 280 park-and-ride spaces.

Alternative B2A: Optional 220th Street SW Station (elevated)**Mountlake Terrace Transit Center Station**

With Alternative B2A, there would be no impacts to on-street parking, off-street parking, or to the park-and-ride lot spaces at the Mountlake Terrace Transit Center Station.

220th Street SW Station

The 220th Street SW Station park-and-ride lot would require a new driveway along 60th Avenue West. There is existing on-street parking along 60th Avenue West, and approximately four on-street parking spaces would likely be removed to accommodate the driveway. There would be no impacts to off-street parking.

A 200-space surface park-and-ride lot is proposed for the 220th Street SW Station.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

Mountlake Terrace Freeway Station

With Alternative B4, there would be no impacts to on-street parking, off-street parking, or to the park-and-ride lot spaces at the Mountlake Terrace Transit Center Station.

Segment C: Mountlake Terrace to Lynnwood

Table 5-38 summarizes the parking impacts along the Segment C alignment by alternative. There are several locations along Segment C where the alignment or light rail station would acquire a building. The parking associated with these buildings was not considered a parking impact because the parking need would be removed. With the Preferred Alternative, 27 off-street parking spaces would be removed.

Table 5-38. Segment C Parking Impacts

Alternative	Parking Spaces Removed		
	On-Street	Off-Street ^a	Total
Preferred Alternative (C3 Modified)	0	27	27
Preferred Alternative (C3 Modified) with options	0	27	27
Alternative C1	0	8	8
Alternative C2	0	4	4
Alternative C3	0	0	0

^a Off-street does not include park-and-ride spaces.

Table 5-39 shows the proposed change in park-and-ride capacity at stations under each Segment C alternative. There would be approximately 1,900 park-and-ride spaces after construction of the proposed new park-and-ride with each alternative except for the Preferred Alternative with options, that would result in 2,300 park-and-ride spaces after construction of the new park-and-ride facility.

Table 5-39. Segment C Park-and-Ride Impacts and Proposed New Parking Spaces

Station	Alternative	Total Existing Parking Spaces	Removed Parking Spaces ^a	Proposed New Parking Spaces	Parking Spaces after Project	Net Change in Parking Spaces
Lynnwood Transit Center Station – Modified Alternative	Preferred Alternative (C3 Modified)	1,370	1,120	1,650	1,900	530
Lynnwood Transit Center Station – Modified Alternative with Additional Parking	Preferred Alternative with Options	1,370	1,120	2,050	2,300	930
200th Street SW Station	C1	1,370	370	900	1,900	530
Lynnwood Transit Center Station	C2	1,370	670	1,200	1,900	530
Lynnwood Transit Center Station	C3	1,370	1,120	1,650	1,900	530

^a Includes parking spaces removed for column placement where applicable.

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

Lynnwood Transit Center Station—Modified Alternative

At the Lynnwood Transit Center Station there would be 1,120 parking spaces removed and 1,650 new spaces constructed in a garage, resulting in a 1,900-space park-and-ride facility. This represents a net gain of 530 park-and-ride spaces.

Preferred Alternative (C3 Modified) with Options: Along I-5 to Lynnwood Park-and-Ride

Lynnwood Transit Center Station—Modified Alternative with an Additional 400 Spaces

At the Lynnwood Transit Center Station there would be 1,120 parking spaces removed and 2,050 new spaces constructed in a garage, resulting in a 2,300-space park-and-ride facility. This represents a net gain of 930 park-and-ride spaces.

Alternative C1: 52nd Avenue West to 200th Street SW

200th Street SW Station

At the 200th Street SW Station there would be 370 spaces removed and 900 new spaces constructed, resulting in a 1,900-space park-and-ride facility. The park-and-ride is located south of 200th Street SW between 48th Avenue West and 46th Avenue West.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

Lynnwood Transit Center Station

At the Lynnwood Transit Center Station there would be 670 spaces removed and 1,200 new spaces constructed, resulting in a 1,900-space park-and-ride facility.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Lynnwood Transit Center Station Option 1

With Option 1, at the Lynnwood Transit Center Station there would be 1,170 parking spaces removed and 1,700 new spaces constructed, resulting in a 1,900-space park-and-ride facility.

Lynnwood Transit Center Station Option 2

With Option 2, at the Lynnwood Transit Center Station all of the existing 1,370 parking spaces would be removed and 1,900 new spaces would be constructed, resulting in a 1,900-space park-and-ride facility.

5.8 Safety

Traffic safety impacts associated with the light rail alternatives were assessed qualitatively for each alternative with consideration for what and how travel characteristics would change near existing CALs, and any changes in the transportation network that could result in an increase in the potential conflicts between modes of travel that could affect overall safety.

Guideway and Alignment

The Lynnwood Link Extension light rail would be constructed in the public right-of-way, with some segments at-grade and some elevated. The light rail guideway would be elevated where it would cross public streets and private driveways or property access. Where the guideway is at-grade, there would be no street crossings or the guideway would pass below the street.

The Preferred Alternative and other light rail alternatives would construct an elevated guideway crossing of I-5. The Preferred Alternative and other light rail alternatives would not change the configuration of the I-5 roadway itself, nor would they impact traffic operating conditions on the roadway, so no operating impacts on I-5 related to safety are anticipated. The collision information on I-5 shows that most incidents are congestion-related due to slowing or stopped traffic in lanes or merge and weave actions.

The Preferred Alternative and other light rail alternatives involve structural and visual changes to parts of the I-5 roadside environment, which could affect safety

conditions. New retaining walls, safety barrier, guardrail or columns would be constructed along the roadway. Trains running on guideways along I-5 could in some locations project light into traffic lanes. The amount of increased hazard presented by these changes along I-5 differs by location and depends on factors such as the highway configuration, traffic volumes, speeds, topography, the presence of shoulders or refuge areas, safety barriers or guardrails, and the distance between the lanes and a new structure or barrier. While design measures may help reduce a safety concern, they may not fully remove it. For example, a guardrail in front of a structure may reduce the hazard presented by a new column along the roadway, but guardrails themselves are potential hazards. Such features of the project within the I-5 right-of-way must conform with FHWA's regulatory requirements for managing the right-of-way. The project would undergo a detailed safety analysis and further consideration of hazard minimization measures during final design as part of WSDOT and FHWA review and approval processes for the use of I-5 right-of-way.

The increase in general traffic volumes, transit movements, pedestrians, and bicyclists near stations could increase the risk of traffic conflicts and conflicts between travel modes. The station area design would incorporate elements to reduce conflicts between travel modes.

Interchanges and Intersections

Several alternatives in Segment A would include interchange modifications at the NE 130th Street and NE 145th Street interchanges—two locations with identified CALs. These changes to the interchange ramp configurations would help to address the safety risks at the CALs but could also result in a safety benefit. The reconstruction of the NE 130th Street interchange would include grade-separation for the northbound off-ramp (a former CAL), which would remove the ramp terminus intersection and remove conflicting cross-street traffic, and thereby would improve safety for travelers. The ramp would connect directly to the 5th Avenue NE at NE 130th Street intersection with lane configuration that is comparable to existing. Expected safety benefits would reflect the removal of side-street conflicts and right-angle accidents at the existing ramp.

With a station at NE 145th Street, the intersection of 5th Avenue NE at NE 145th Street (and 5th Avenue NE adjacent to the station) would be reconstructed with features to enhance pedestrian, bicycle, and transit safety through this CAL intersection and the northbound on-ramp intersection would have signal control which would help reduce left-turn accidents at this CAL.

Common to all alternatives, pedestrian and bicycle volumes are expected to increase at intersections near the proposed stations. This increase could result in a greater potential for pedestrian/vehicle, pedestrian/bicycle, or bicycle/vehicle conflicts;

however, much of these impacts can be addressed with careful design of the station areas and right-of-way features.

Key observations and findings related to safety include the following:

- Light rail stations are being considered at or near existing CALs, notably the NE 145th Street Station (northbound off-ramp to 5th Avenue NE, 5th Avenue NE at NE 145th Street, northbound on-ramp from 5th Avenue NE), 200th Street SW Station (200th Street SW at 48th Avenue West and at 46th Avenue West), and the Lynnwood Park-and-Ride and Transit Center Stations (200th Street SW at 48th Avenue West and at 46th Avenue West).
- The Preferred Alternative and Alternatives A1, A5, and A10 would reconstruct the NE 130th Street interchange and could improve safety conditions at the NE 130th Street northbound off-ramp to 5th Avenue NE.
- NE 145th Street Station is in the immediate vicinity of three CALs: northbound off-ramp to 5th Avenue NE, NE 145th Street at 5th Avenue NE, and northbound on-ramp from 5th Avenue NE. The Preferred Alternative would address the CAL at the northbound on-ramp by relocating the ramp, adding access from the park and ride facility and adding signal control to accommodate the high left-turning traffic accessing the ramp. The station design would need to reflect the increase in pedestrian traffic and potential for at-grade conflicts between pedestrians and vehicle movements at the ramps to and from I-5. If a station is selected for NE 145th Street, the station design and design of adjacent streets would need to address the current and expected increase in conflicts between vehicles and between travel modes near the station, as reflected in the existing CALs.
- Lynnwood Park-and-Ride and Transit Center Station locations would both increase traffic through the CALs at 200th Street SW at both 48th Avenue West and 46th Avenue West with increased volumes of pedestrians and bicyclists. Both CALs appear related to congestion along 200th Street SW. Mitigation for this location may need to include refined design for the arterial or modifications to the signal control.

Segment A: Seattle to Shoreline

The Preferred Alternative and Alternatives A1, A5, and A10 would improve safety with the reconstruction of the NE 130th Street interchange, including grade-separation of southbound 5th Avenue NE at the NE 130th Street northbound off-ramp from I-5. This reconfiguration of the off-ramp is expected to improve safety by reducing right-angle accident occurrence at this location.

The Preferred Alternative and Alternatives A3 and A11 would relocate and signalize the NE 145th Street interchange northbound on-ramp to I-5 from 5th Avenue NE, which would affect an identified CAL with predominantly left-turn crashes and would improve safety at this on-ramp with signalized left-turn control at the intersection.

Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

With the Preferred Alternative, the guideway would be grade-separated at the new NE 130th Street interchange and the northbound off-ramp. An elevated guideway would cross the NE 145th Street interchange. Emergency access must be maintained to the fire station at NE 155th Street with all Segment A alternatives. This access can be incorporated in the design of the light rail system.

The guideway would result in reconstruction and some relocation of local streets from NE 158th Street to NE 174th Street. Column locations may slightly affect property/driveway access. The project design would ensure adequate sight distance is maintained at intersections and driveways.

NE 145th Street Station

Three CALs were identified near the NE 145th Street Station: 5th Avenue NE at NE 145th Street intersection, I-5 northbound off-ramp to 5th Avenue NE, and I-5 northbound on-ramp from 5th Avenue NE. Operation of the 5th Avenue NE/NE 145th Street intersection and the northbound off-ramp to 5th Avenue NE would not change with Alternative A1.

The Preferred Alternative would relocate the northbound on-ramp to I-5 from 5th Avenue NE, add access from the park and ride facility and add signal control, which would improve safety by reducing left-turning conflicts at the ramp terminus. The design for the station area would consider the increase in potential conflicts involving pedestrians, bicycles, and vehicles.

Two private schools are located within a 0.50 mile radius of the proposed station (Lakeside High School and Lakeside Middle School), both on the west side of I-5. The Evergreen School, located on Meridian Avenue North, and Parkwood Elementary on North 155th Street are just beyond the 0.50 mile radius from the proposed station. Some increase in traffic is expected adjacent to the sidewalks and pedestrian paths that connect from the station to the schools. Increases in traffic could increase potential pedestrian-vehicular conflicts. The net new increase in traffic from the proposed station to streets near these schools would result from the increase in park-and-ride capacity and drop off/pick up activity generated by the station with an origin or destination that passes by the school. This increase in traffic resulting from the project would be in addition to background traffic increases associated with growth and development in the vicinity.

Both 5th Avenue NE and North/NE 145th Streets are designated as T-3 freight facilities. Increased station area traffic on NE 145th Street or 5th Avenue NE is not expected to adversely affect freight movement or safety along these facilities.

NE 185th Street Station

No CAL was identified near the NE 185th Street Station.

With Alternative A1, a fourth leg would be added to the intersection of 5th Avenue NE/7th Avenue NE at NE 185th Street at the station, which would increase the number of conflicting movements at the intersection. This, in turn, could increase the potential for accidents. Careful design could mitigate this increased risk of accidents.

There are two preschools at NE 190th Street, with walk access along 8th Avenue NE near the station. St. Mark Catholic School is located within a 0.50 mile radius from the proposed station. Increases in traffic could increase potential pedestrian-vehicular conflicts. The net new increase in traffic from the proposed station to streets near these schools would result from the increase in drop off/pick up activity generated by the station with an origin or destination that passes by the school. The station is expected to add 35 vehicle trips in the morning peak hour and 120 vehicle trips in the evening peak hour along NE 185th Street arterial adjacent to the station. NE 185th Street is designated as a T-2 freight facility. Increased station area traffic on NE 185th Street is not expected to adversely affect freight movement or safety along this facility.

Preferred Alternative with Options: At-grade/Elevated with NE 130th, NE 145th and NE 185th Street Stations

Safety effects would be the same as for the Preferred Alternative except for the optional NE 130th Street Station as indicated below.

Optional NE 130th Street Station

No CAL was identified near the NE 130th Street Station.

Safety would be improved with the reconstruction of the NE 130th Street interchange and grade-separation at the northbound off-ramp, by removing right-angle conflicts at the ramp terminus.

There are three private schools within 0.50 mile of the proposed NE 130th Street Station (Lakeside Middle School, Seattle Jewish Community School, and St. Matthews School) and two high schools (Ingraham High School and Lakeside High School) just beyond the 0.50 mile radius. Some increase in traffic is expected along the sidewalks that connect from the station to the schools. Increases in traffic could increase potential pedestrian-vehicular conflicts. The net new increase in traffic from the proposed station to streets near these schools would result from the increase in park-and-ride capacity and drop off/pick up generated by the station with an origin or destination that passes by the school. This increase in traffic resulting from the

project would be in addition to background traffic increases from growth and development in the vicinity.

North/NE 130th Street is designated as a T-3 freight facility, and Roosevelt Way NE east of 5th Avenue NE is designated as a T-4 freight facility. Increased station area traffic on NE 130th Street is not expected to adversely affect freight movement or safety along these facilities.

Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

The safety impacts of Alternative A1 are similar to the Preferred Alternative. The NE 117th Street overpass is reconstructed and would be designed to meet current standards for lane widths, bicycle facilities, and sidewalks, which could improve the safety of the NE 117th Street overcrossing.

NE 145th Street Station

The safety impacts at the NE 145th Street Station would be similar to the Preferred Alternative.

NE 185th Street Station

The safety impacts at the NE 145th Street Station would be similar to the Preferred Alternative.

Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

Traffic safety concerns along the Alternative A3 alignment are similar to those identified for the Preferred Alternative except for the following locations: where the alignment would cross 1st Avenue NE near NE 117th Street, at the curve along 1st Avenue NE, and where the elevated alignment would cross the NE 130th Street ramp and intersection of 5th Avenue NE at NE 130th Street. Column locations for the guideway would be designed to avoid visibility obstructions along the curve.

NE 145th Street Station

Traffic safety issues and impacts with Alternative A3 would be the same as with the Preferred Alternative.

NE 185th Street Station

Traffic safety issues and impacts with Alternative A3 would be the same as with the Preferred Alternative.

Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Traffic safety concerns along the Alternative A5 alignment would be similar to the Preferred Alternative; however, there is a potential sight distance constraint where the alignment would pass under the northbound off-ramp at the NE 130th Street interchange.

NE 130th Street Station

Similar to the Preferred Alternative, safety would be improved with the reconstruction of the NE 130th Street interchange and grade-separation at the northbound off-ramp.

There are three private schools within 0.50 mile of the proposed NE 130th Street station (Lakeside Middle School, Seattle Jewish Community School, and St. Matthews School) and two high schools (Ingraham High School and Lakeside High School) just beyond the 0.50 mile radius. Some increase in traffic is expected along the sidewalks that connect from the station to the schools. Increases in traffic could increase potential pedestrian-vehicular conflicts. The net new increase in traffic from the proposed station to streets near these schools would result from the increase in park-and-ride capacity and drop off/pick up generated by the station with an origin or destination that passes by the school. This increase in traffic resulting from the project would be in addition to background traffic increases from growth and development in the vicinity.

North/NE 130th Street is designated as a T-3 freight facility, and Roosevelt Way NE east of 5th Avenue NE is designated as a T-4 freight facility. Increased station area traffic on NE 130th Street is not expected to adversely affect freight movement or safety along these facilities.

NE 155th Street Station

The NE 155th Street Station has two design options with Alternative A5. The difference is in the location of the paratransit and pick-up/drop-off areas for the station. Both options would locate the bus stops on NE 155th Street near the station.

Option 1A would locate the paratransit function on-street, westbound on NE 155th Street under the station and adjacent to the south elevator. On-street bus stops would be located on NE 155th Street under (eastbound) and just east of the station (westbound). Escalators would be located south of NE 155th Street, which could result in increased numbers of pedestrians crossing NE 155th Street near the station and lead to increased conflicts and risk of pedestrian accidents. The passenger pick-up/drop-off area would be adjacent to the parking garage on the south side of NE

155th Street, with pedestrian access to the station along the east and south sides of the fire station. Combination of transit, drop-off, and pedestrian crossing activity could increase potential conflicts under I-5 and near the 1st Avenue NE/NE 155th Street intersection. The station design would need to carefully coordinate these access modes and traffic circulation.

Option 1B would locate the paratransit and passenger pick-up/drop-off functions off-street, adjacent to the north end of the station, with elevator and escalator access to the north end of the platform. Locating the on-street bus stops under the station would provide station access without crossing NE 155th Street at-grade. The proximity of bus stops to 1st Avenue NE at the NE 155th Street intersection would warrant careful design for station access and circulation.

Parkwood Elementary School and The Evergreen School are located within a 0.50 mile radius of the proposed station. A marked school crossing with overhead “CROSSWALK” signs and flashing beacons is located on North 155th Street at Wallingford Avenue North at Parkwood Elementary. Both Parkwood Elementary and The Evergreen School connect to the proposed station along arterials with sidewalks. Lakeside High School is at NE 145th Street and 1st Avenue NE, near the 0.50 mile radius from the proposed station. 1st Avenue NE would be the most direct connection from Lakeside High School to the proposed station; however, there is no continuous walkway/sidewalk facility on 1st Avenue NE.

NE 155th Street and 5th Avenue NE are designated T-3 freight facilities. Fire Station access is a critical truck activity near the NE 155th Street Station. Increased station area traffic and transit operations are not expected to adversely affect freight safety or operation at these facilities.

No CAL was identified near the NE 155th Street Station. No net change in traffic safety is expected near the NE 155th Street Station.

NE 185th Street Station

Traffic safety issues and impacts with Alternative A5 would be the same as with the Preferred Alternative.

Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Traffic safety concerns along Alternative A7 would be the same as for Alternative A3.

NE 130th Street Station

Alternative A7 would not affect safety in the vicinity of the station.

NE 155th Street Station

Traffic safety issues and impacts would be the same with Alternative A7 as with Alternative A5.

NE 185th Street Station

Traffic safety issues and impacts would be the same with Alternative A7 as with Alternative A1.

Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Traffic safety concerns with Alternative A10 would be the same as with Alternative A5 from Northgate to the NE 130th Street Station, the same as Alternative A1 from the NE 130th Street Station to NE 185th Street, and the same as Alternative A5 at the NE 185th Street Station.

NE 130th Street Station

Traffic safety issues and impacts with Alternative A10 would be the same as with Alternatives A1 and A5.

NE 145th Street Station

Traffic safety issues and impacts with Alternative A10 would be the same as with Alternative A1.

NE 185th Street Station

Traffic safety issues and impacts with Alternative A10 would be the same as with Alternative A1.

Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Traffic safety concerns with Alternative A11 would be the same as with Alternative A3 from Northgate to the NE 130th Street interchange, the same as Alternative A7 at the NE 130th Street Station, the same as Alternative A3 from the NE 130th Street Station to NE 158th Street, the same as Alternative A1 from NE 158th Street to NE 174th Street, and the same as Alternative A3 near the NE 185th Street Station.

NE 130th Street Station

Traffic safety issues and impacts with Alternative A11 would be the same as with Alternative A7.

NE 145th Street Station

Traffic safety issues and impacts with Alternative A11 would be the same as with Alternative A1.

NE 185th Street Station

Traffic safety issues and impacts with Alternative A11 would be the same as with Alternative A1.

Segment B: Shoreline to Mountlake Terrace

Common to all Segment B alternatives, the light rail guideway would cross I-5 with support columns in the I-5 right-of-way. Many of the columns placed for the guideway would be placed behind existing guardrails or protective barriers. Those columns placed where no protective barrier exists would be designed to current standards for clear zone and protection. Each location would be addressed on a case by case basis in preliminary and final design phases in coordination with WSDOT and FHWA.

Common to all Segment B alternatives, pedestrian and bicycle volumes are expected to increase at intersections near the proposed stations. This increase could result in a greater potential for pedestrian/vehicle, pedestrian/bicycle, or bicycle/vehicle conflicts; however, much of this impact can be addressed with careful design of the station area and right-of-way features.

Preferred Alternative: East Side to Mountlake Terrace Transit Center to West Side

Under the Preferred Alternative, there would be no street crossings along the at-grade alignment. The guideway would pass under the reconstructed pedestrian bridge over I-5. Column locations would be designed to ensure adequate sight distance and visibility within the SR 104 interchange areas.

The alignment would be elevated over 236th Street SW adjacent to the signalized northbound off-ramp. Just north of the Mountlake Terrace Transit Station the guideway would cross to the west side of I-5, passing under 228th Street SW and under 220th Street SW. Light rail operation in the I-5 right-of-way may affect adjacent traffic on I-5 where headlight glare could affect drivers, but this would be mitigated with glare screens or other forms of shielding devices. The elevated guideway would cross 220th Street SW near the southbound ramps and also 212th Street SW.

Mountlake Terrace Transit Center Station

No CAL was identified near the Mountlake Terrace Transit Center.

Private schools (Cedar Park Christian School, The Expedition School, The Cornerstone School, and Snohomish County Christian High School) are located east of 56th Avenue West (within and at the 0.50 mile radius). No change in vehicle traffic is expected along the streets adjacent to these schools due to the Mountlake Terrace Transit Center Station with the Preferred Alternative. Terrace Park Elementary School is located beyond 0.50 mile from the proposed station, and no change in traffic is expected along walk routes to this school due to the Mountlake Terrace Transit Center Station. However, the increase in station area traffic, along with a general increase in all travel modes with the Preferred Alternative, could increase the potential for conflict and accidents.

Both 236th Street SW and 56th Avenue West are T-3 freight facilities. No change in freight safety or operation is expected due to the Mountlake Terrace Transit Center Station because there would be no increase in park-and-ride spaces or expected change in general traffic volumes.

Preferred Alternative with Options: East Side to Mountlake Terrace Transit Center to West Side

Traffic safety issues with the optional 220th Street SW Station would be the same as with the Preferred Alternative except as described below.

Optional 220th Street SW Station (elevated)

Access to the 220th Street SW Station over 200th Street SW would be provided from the 220th Street SW access intersection to the park-and-ride lot, located between the southbound I-5 ramps intersection and 220th Street SW at 64th Avenue West. The station would be located to the south of 220th Street SW. One CAL was identified near the 220th Street SW Station: 220th Street SW at 66th Avenue West. The intersection of 220th Street SW at 66th Avenue West is signalized and could experience an increase in pedestrian, bicycle, and transit traffic, which may increase potential conflicts between travel modes, and could reduce intersection safety.

Passenger pick-up/drop-off, paratransit zone, and bus stops would be located on site within the park-and-ride at the station located between the station and 220th Street SW. Careful site design will be needed to manage transit, passenger pick-up/drop-off, and paratransit activities.

Bicycle access to the station could occur along 220th Street SW, with connection via the on-street bus stops or along 64th Avenue West, similar to the vehicle access to the station.

Transit, pedestrian, and bicyclist concerns would occur with the proposed on-street bus stops on 220th Street SW; however, the concerns would be the same as for any on-street arterial bus stop.

220th Street SW is designated as a T-3 freight facility. No change in freight safety is expected for this facility.

Alternative B1: East Side to Mountlake Terrace Transit Center to Median

Under Alternative B1, there would be no street crossings along the at-grade alignment. The guideway would pass under the reconstructed pedestrian bridge over I-5. Column locations would be designed to ensure adequate sight distance and visibility within the SR 104 interchange areas.

The alignment would be elevated over 236th Street SW adjacent to the signalized northbound off-ramp. In the vicinity of the Mountlake Terrace Transit Station, the guideway would cross I-5 to the median, passing under 228th Street SW and under 220th Street SW without any safety issues. Light rail operation in the median may affect adjacent traffic on I-5 where headlight glare could affect drivers, which would be mitigated with glare screens. The elevated guideway would also cross 212th Street SW.

Mountlake Terrace Transit Center Station

No CAL was identified near the Mountlake Terrace Transit Center.

Private schools (Cedar Park Christian School, The Expedition School, The Cornerstone School, and Snohomish County Christian High School) are located east of 56th Avenue West (within and at the 0.50 mile radius). No change in vehicle traffic is expected along the streets adjacent to these schools due to the Mountlake Terrace Transit Center Station with Alternative B1. Terrace Park Elementary School is located beyond 0.50 mile from the proposed station, and no change in traffic is expected along walk routes to this school due to the Mountlake Terrace Transit Center Station. The increase in station area traffic, along with a general increase in all travel modes with Alternatives B1 and B2, could increase the potential for conflicts and accidents.

Both 236th Street SW and 56th Avenue West are T-3 freight facilities. No change in freight safety or operation is expected due to the Mountlake Terrace Transit Center Station because there would be no increase in park-and-ride spaces or expected change in general traffic volumes.

Alternative B2A: Optional 220th Street SW Station (elevated)

Traffic safety issues with Alternative B2A would be similar to the Preferred Alternative.

220th Street SW Station (elevated)

Access to the 220th Street SW Station over 200th Street SW would be provided from the park-and-ride garage driveway at 219th Street SW. This station option would

require relocation of the southbound I-5 ramp intersection on 220th Street SW to the east.

Passenger pick-up/drop-off, paratransit zone, and bus stops would be on 220th Street SW to the west of the relocated ramp intersection. Connection to the station platform would be via a walkway along 220th Street SW with access to elevators and escalators. Passenger pick-up/drop-off and bus stops would be approximately 200 feet to the west. This location may become an area of potential conflicts and safety concerns because it is adjacent to a major arterial and close to the I-5 ramps. Careful design will be needed to manage transit, passenger pick-up/drop-off, and paratransit activities on this street.

Bicyclists could access the station along 220th Street SW, with a connection via the on-street bus stops or along 64th Avenue West, similar to the vehicle access to the parking garage and station.

Transit, pedestrian, and bicyclist concerns would occur with the proposed on-street bus stops on 220th Street SW; however, the concerns would be the same as for any on-street arterial bus stop.

220th Street SW is designated as a T-3 freight facility. No change in freight safety is expected for this facility.

One CAL was identified near the 220th Street SW Station: 220th Street SW at 66th Avenue West. The intersection of 220th Street SW at 66th Avenue West is signalized and could experience an increase in pedestrian, bicycle, and transit traffic, which may increase potential conflicts between travel modes, and could reduce intersection safety.

Alternative B4: East Side to Mountlake Terrace Freeway Station to Median

The Alternative B4 alignment would cross the northbound on-ramp from SR 104 and the northbound off-ramp to 236th Street SW, where column locations would be designed to ensure adequate sight distance. The alignment would cross to the I-5 median, where the inside shoulders would be reduced 2 feet to 3 feet for approximately 1,500 feet along northbound and southbound I-5. The narrow shoulder could affect safety and reliability of operation along I-5 because there would be no shoulder area for disabled vehicles in this segment of the freeway. The reduced shoulder widths would occur over a relatively short distance and may not adversely affect accident occurrence. Glare screens would be needed to reduce glare impacts on motorists on I-5 from light rail operation in the median.

Mountlake Terrace Freeway Station

No CAL was identified near the Mountlake Terrace Freeway Station. Traffic safety issues and impacts with Alternative B4 would be the same as with Alternative B1.

Segment C: Mountlake Terrace to Lynnwood

Eight CALs were identified near the Lynnwood Transit Center and Park-and-Ride:

- 204th Street SW at 44th Avenue West (between I-5 ramps)
- 200th Street SW at 46th Avenue West
- 200th Street SW at 48th Avenue West
- 196th Street SW at 36th Avenue West
- 196th Street SW at 40th Avenue West
- 196th Street SW at 44th Avenue West
- 196th Street SW at 48th Avenue West
- 196th Street SW at 52nd Avenue West

No changes are proposed to the network or facilities near the CALs on 196th Street SW; thus, no change in safety is expected for these CALs.

No public schools are located within 0.50 mile of the Lynnwood station options.

44th Avenue West is designated as a T-3 freight facility. There is no expected change in safety for freight with any of the Lynnwood stations.

Common to all alternatives, pedestrian and bicycle volumes are expected to increase at intersections near the proposed stations. This increase could result in a greater potential for pedestrian/vehicle, pedestrian/bicycle, or bicycle/vehicle conflicts; however, much of these impacts can be addressed with careful design of the station area and right-of-way features.

Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride

The elevated guideway for the Preferred Alternative alignment would require attention to column locations to avoid affecting sight distance and visibility at intersections, side streets, and driveways. Visibility is important for safety along curved roadways, where column location could restrict visibility. Locations of concern include the reconstructed 208th Street SW, the Interurban Trail crossing, and 44th Avenue West crossing near the HOV direct access ramps to I-5.

Property access and circulation under the elevated guideway would be affected; however, site circulation and access modifications would be integrated with the

guideway design. The guideway would be elevated through the park-and-ride facility and at the station.

Lynnwood Transit Center Station

The Lynnwood Park-and-Ride Station would increase the focus of pedestrian movement to the west side of 46th Avenue West by providing stairs, escalators, and elevators at the south end of the station. Light rail passengers moving between the transit center and the station would use the station mezzanine to cross the HOV direct access ramp. This station would bring more traffic into the site for passenger pick-up/drop-off at the station, crossing transit vehicle and pedestrian movements at and near the transit center, and thereby increasing the potential for pedestrian and vehicle conflicts.

Two CALs were identified on SW 200th Street near the Lynnwood Park-and-Ride Station where increased pedestrian and bicycle traffic is expected. Reconstruction of the intersections at 200th Street SW may be required with the project, where careful design could help to address this increased potential for conflicts between travel modes.

Preferred Alternative (C3 Modified) with Options: Along I-5 to Lynnwood Park-and-Ride

Safety effects would be similar to those for the Preferred Alternative.

Alternative C1: 52nd Avenue West to 200th Street SW

The elevated guideway along Alternative C1 would require attention to column locations to avoid affecting sight distance and visibility at intersections, side streets, and driveways, similar to the Preferred Alternative. Locations of concern include intersections and site access locations along the elevated guideway alignment to the station.

200th Street SW Station

Traffic safety issues and impacts are expected to stay approximately the same near the 200th Street SW Station with Alternative C1.

The 200th Street SW Station may increase transit activity at the in-lane bus stops on this street adjacent to the station. The main transfer function would occur at the Lynnwood Transit Center, south of the station, with no expected change in safety.

Two CALs were identified near the 200th Street SW Station where increased pedestrian and bicycle traffic is expected. Reconstruction of the intersection at 200th Street SW may be required with the project, where careful design could help to mitigate this increased potential for conflicts between travel modes.

The direct access ramp at 46th Avenue West intersection has all-way stop control and may require signal control with the increase in vehicle, transit, pedestrian, and bicycle traffic through the intersection.

Alternative C2: 52nd Avenue West to Lynnwood Transit Center

Traffic safety impacts would be the same with Alternative C2 as with the Preferred Alternative and along the elevated guideway alignment to 204th Street SW. Visibility is important for safety along curved roadways, where column location could restrict visibility. Property access and circulation under the elevated guideway would be affected; however, site circulation and access modifications would be integrated with the guideway design. Locations of concern include intersections and site access locations along the elevated guideway alignment to the station. The guideway would be elevated through the park-and-ride facility and at the station.

Lynnwood Transit Center Station

An increase is expected in pedestrians crossing from the station to the transit center, and crossing the east-west section of 48th Avenue West, which is a main circulation route within the park-and-ride and transit center facility. Site-specific design features could manage the pedestrian volume and reduce safety risks.

Alternative C3: Along I-5 to Lynnwood Park-and-Ride

Traffic safety impacts with Alternative C3 would be similar to the Preferred Alternative along the elevated guideway alignment. Visibility is important for safety along curved roadways, where column location could restrict visibility. Property access and circulation under the elevated guideway would be affected; however, site circulation and access modifications would be integrated with the guideway design. Locations of concern include the reconstructed 208th Street SW, the Interurban Trail crossing, and 44th Avenue West crossing near the HOV direct access ramps to I-5.

Lynnwood Transit Center Station

The Lynnwood Park-and-Ride Station would increase the focus of pedestrian movement through the intersection of 46th Avenue West at 48th Avenue West and across the access to the HOV direct access ramp. This station would bring more traffic into the site for passenger pick-up/drop-off at the station, crossing transit vehicle and pedestrian movements at and near the transit center, and thereby increasing the potential for pedestrian and vehicle conflicts.

6 CONSTRUCTION IMPACTS

This chapter discusses and compares potential transportation mobility impacts caused by construction of the light rail alternatives. The Lynnwood Link project is expected to be constructed by two contractors, one working on the south half and one working on the north half. Overall construction duration would be approximately two years in any given portion of the corridor. Linear projects such as Lynnwood Link are typically divided into various segments or line sections for construction. Segments include construction of retained cut-and-fill guideway, elevated structures, stations (including park-and-ride, station platforms, transit center, substation and control facilities) and roadway reconstruction. Each construction activity would vary in duration. Construction staging at stations would occur throughout the duration of the project.

The construction approach will be refined during the final design effort to establish the limits and parameters for various construction phases, construction contracts, and active work zones. Construction impacts identified in this chapter are estimated based on the level of design completed to date and the known construction activities. Key observations and findings include the following:

- Sound Transit and WSDOT will work to minimize the duration and impact of lane closures and reductions by (a) maintaining the same number of travel lanes except for short-duration closures that would occur during nights and weekends, (b) establishing detour routes on nearby arterials for nighttime closures, (c) maintaining WSDOT traffic management systems (closed circuit television [CCTV] cameras and monitoring, ramp metering, data stations, and variable message signing), and (d) providing mitigation through supplemental incident response team service and Transportation Demand Management strategies.
- At-grade rail alignment alternatives (Preferred Alternative, A1, A5, and A10) include bridge reconstruction over I-5. The deconstruction of bridge segments over I-5 would require temporary night time or weekend closures of one I-5 direction. Construction techniques to minimize closures will be developed during final design.
- The shoulders on I-5 would be temporarily closed on nights and weekends to develop space for construction activities adjacent to the freeway or in the median. Longer term construction activities could occur adjacent to the freeway shoulders within some area. All modes of travel could experience an increase in congestion and travel times due to the effect of construction activity near the freeway. Construction activity will be planned to minimize the need for closures and reductions in the widths of lanes and shoulders.
- For all street reconstruction, travel lanes on local streets along the guideway would experience periodic daytime closures. Truck access to the guideway construction would be along city arterials leading to streets adjacent to the guideway.

- At the Mountlake Terrace Transit Center Station, the Preferred Alternative and Alternatives B1 and B2A require construction in the median of I-5 adjacent to the existing transit center. This construction activity would require the direct access bus ramps and therefore the freeway station to be closed for approximately 6 to 9 months.
- In Lynnwood, construction of the light rail station options would temporarily reduce park-and-ride spaces; Alternative C1 could result in a loss of approximately 250 parking spaces, Alternative C2 660 spaces, and Alternative C3 560 spaces. It is suggested that during development of the maintenance of traffic (MOT) plans, an evaluation of the number and location of concurrent construction activities be made, and strategies implemented to minimize added construction impacts due to concurrent activities.
- Construction activities and impacts are similar across alternatives.

6.1 General Corridorwide Construction Effects

The project's construction along I-5, which includes crossing over the freeway under all alternatives north of the Mountlake Terrace Transit Center, would involve temporary changes to I-5 roadway operations. It would also introduce features affecting shoulders as well as the roadside environment. These would be temporary nighttime lane closures along I-5 throughout the project for placing safety barriers between I-5 and adjacent construction zones. Shoulders would be closed to provide space for construction activities. Construction traffic management plans would reduce the need for or duration of shoulder closures and lane reductions to minimize the impacts. Where necessary, access points from I-5 would be from on-ramps and off-ramps where adequate acceleration and deceleration for trucks can occur to minimize impacts on general purpose traffic and interchange operations on I-5. Portions of the alignment would have construction access from the local arterials and streets to allow construction work.

All alternatives could have some impacts on traffic operations on I-5 during construction where the guideway crosses the freeway. This would result in nighttime closures in each direction of mainline I-5, with traffic detours during installation of the girders for the guideway bridges. Vertical clearance would be maintained on I-5. Construction access points, closures, and changes in I-5 operations will require approval from FHWA and WSDOT. *Appendix F, Conceptual Plans* in the FEIS provides a graphical summary of construction staging areas and haul routes throughout the project corridor.

A Maintenance of Traffic Plan that addresses all travel modes will be prepared during final design for agency approval. This plan will include detailed design drawings establishing all physical and operating characteristics for staging, access, lane or shoulder closures/transitions, hauling, traffic management, detours, lane modifications, and other construction zones or activities. The plan would incorporate

WSDOT's established guidance for best practices and methods to be applied during construction periods, many of which are focused on reducing congestion impacts and minimizing safety hazards. For example, typical measures include signage, traveler advisories, special lighting for work zones and travel lanes, scheduling work during lower volume travel times, detailed contractor requirements, a variety of traffic and travel demand management strategies, and procedures for any construction directly affecting the active roadway.

The light rail guideway requires crossing I-5 to connect from Northgate on the east side of I-5 to the Lynnwood Transit Center on the west side of I-5. In addition, several alternatives include local street bridge reconstruction over I-5. Nighttime closures of I-5 would be required where the guideway or other bridges cross over I-5 during the placement of structural elements. Reconstruction of bridges over I-5 may require a one-lane closure in each direction on I-5 to provide space in the median for construction of the bridge column.

Several options would require the replacement of local street bridges over I-5. This is a result of the guideway alignment affecting a column or abutment of a bridge. Several options are possible for conducting bridge reconstruction in phases, which would help to accommodate traffic during construction or reduce construction costs by closing a road to expedite efficient construction activity. This project assumes using these phasing methods dependent on the local road traffic volumes and alternative routes. Where bridges are closed during reconstruction, detours would be provided; however, detours could have secondary impacts on general purpose traffic, bus transit, bicyclists, and pedestrians. Strategic phasing or sequencing of overcrossing closures would minimize the cumulative closure impacts; construction phasing will be addressed accordingly in the construction specifications.

All alternatives would affect traffic operations on arterials adjacent to the guideway and stations; as a mitigation measure, the contractor would keep roadways open, but with flagger control or other means. All alternatives may require utility relocations along the alignment and near the stations. Utility relocations may require temporary lane closures and traffic control plans to maintain property access and circulation. Construction activities along the guideway could temporarily reduce or restrict property access and the contractor would need to maintain access during construction. Impacts on the movement of trucks carrying freight would be approximately the same as for general purpose traffic. Impacts on general purpose traffic, transit operations, nonmotorized travel, and parking are discussed in more detail below, by segment and station areas.

6.1.1 Truck Volumes and Haul Routes

Peak truck trips are expected to occur during earthwork operations and during concrete delivery for both guideway and station construction. For at-grade construction, 4 to 12 trucks per hour are estimated from each work zone. For

elevated guideway construction, peak truck trips are estimated at 4 to 8 trucks per hour for the concrete delivery. Generally, construction truck traffic to station construction sites would use city streets. Multiple work zones may be used during peak operations that could result in higher total project peak truck trips; however, these trips would generally not overlap with each other on the same local streets.

Parking for construction workers would be provided on construction sites accessible from local streets where possible. Parking could occur on city streets where parking is unrestricted.

Some loss of available parking at park-and-ride lots is expected during construction, such as at the Lynnwood Park-and-Ride lot. Further analysis of park-and-ride spaces removed during phases of construction is addressed by alternative for each station in the remainder of this section. Temporary parking would be provided as needed and where feasible to mitigate the impacts.

6.2 Segment A: Seattle to Shoreline

General Purpose Traffic Impacts

Construction of all Segment A alternative alignments begins with an elevated segment in the southeast quadrant of 1st Avenue NE and I-5 ramps/ North 107th Street. This is the location of a Northgate Mall parking lot that is a construction staging area for the north end of Northgate Link and the beginning of Lynnwood Link. Beginning at this location the alignment shifts over 1st Avenue NE at the I-5 ramps/North 107th Street and continues north within the WSDOT right-of-way. Construction north of here would primarily be conducted from staging space within the WSDOT I-5 right-of-way and city streets between Northgate and NE 145th Street. For construction adjacent to I-5, the contractor would establish barrier and work zone areas. Capacity and travel time reliability could be reduced due to the effect of construction activity a. Potential shoulder reductions and narrowed lanes with some alternatives would reduce the availability of the shoulder refuge for breakdowns or incidents.

The light rail would be elevated from the Northgate Station to NE 117th Street. In the vicinity of 1st Avenue NE and the I-5 off-ramp/on-ramp south of NE Northgate Way, as well as NE Northgate Way and the I-5 on-ramp, construction of the elevated guideway would cause periodic daytime lane closures for approximately 6 months. Full roadway closures would occur at night to install girders and straddle bents. This activity would occur for about 1 year. Construction in the vicinity would occur for about 1 year to prepare construction staging and parking areas, drill shafts, construct columns, construct a detention pond, and reconstruct roadways affected by the project. Local street construction activity could include nighttime closures, intermittent daytime closures, and lane closure in one direction. Locations include

1st Avenue NE (North 113th Street to North 117th Street), NE 117th Street, and 5th Avenue NE, depending on the alternative. Options that include construction of an elevated guideway over vehicular traffic would require nighttime closures of the affected facility (i.e., street, ramps, or I-5). Table 6-1 summarizes the major roadway closures in Segment A.

Table 6-1. Segment A: Roadway Closures and Duration

Roadway	Preferred Alternative	Alternative					
		A1	A3	A5	A7	A10	A11
1st Avenue NE	◆	◆	◆	◆	◆	◆	◆
Northbound I-5 off- and on-ramps to/from 1st Avenue NE	◆	◆	◆	◆	◆	◆	◆
NE Northgate Way	◆	◆	◆	◆	◆	◆	◆
Northbound on-ramp from Northgate Way	◆	◆	◆	◆	◆	◆	◆
NE 117th Street	◆	9 to 12 months	◆	◆	◆	◆	◆
I-5 in vicinity of NE 117th Street	◆	Nighttime closure or up to 1 month per direction	---	---	---	---	---
NE 130th Street Station Area							
NE 130th Street Bridge	◆◆ One lane each direction (18 months)	◆◆ One lane each direction (18 months)	◆	◆◆ One lane each direction (18 months)	◆	◆◆ One lane each direction (18 months)	◆
I-5 in vicinity of NE 130th Street	All lanes closed at night to place the girder. All lanes closed one weekend to demolish bridge.	Nighttime or up to 1 month for one lane southbound and 1 month for 1 lane northbound	---	Nighttime or up to 1 month for one lane southbound and 1 month for one lane northbound	---	Nighttime or up to 1 month for one lane southbound and 1 month for one lane northbound	---
5th Avenue NE northbound off-ramp	◆	◆	◆	◆	◆	◆	◆
5th Avenue NE southbound, south of NE 130th Street for braided ramp	12 months	12 months	◆	12 months	◆	12 months	◆

Table 6-1. Segment A: Roadway Closures and Duration

Roadway	Preferred Alternative	Alternative					
		A1	A3	A5	A7	A10	A11
NE 145th Street Station Area							
NE 145th Street	◆	◆	◆	◆	◆	◆	◆
5th Avenue NE northbound off-ramp	◆	◆	◆	◆	◆	◆	◆
5th Avenue NE northbound on-ramp	◆	◆	◆	◆	◆	◆	◆
NE 155th Street Station Area							
NE 155th Street	◆	◆	◆	◆	◆	◆	◆
NE 185th Street Station Area							
NE 175th Street	◆	◆	◆	◆	◆	◆	◆
NE 185th Street bridge	One lane closed for 9 to 12 months	9 to 12 months	◆	1 month	◆	1 month	◆
I-5 in vicinity of NE 185th Street	◆	Nighttime or up to 1 month per direction	---	---	---	---	---

◆ = Periodic nighttime and weekend shoulder or lane closures of I-5, I-5 ramps, and periodic street closures.

◆◆ = Nighttime, more frequent; the alternative would result in more frequent nighttime closures than other alternatives.

--- Denotes not affected by alternative.

Construction Staging, Parking, and Truck Access

Construction staging and access would be from a series of locations along Segment A. As shown in Appendix F of the Final EIS. Priority for access would be from 5th Avenue NE or I-5 ramps. Some areas would be accessed from local streets and are identified in the discussion of impacts by alternative below. Local streets used for construction access and parking could experience an increase in truck and employee traffic. In addition to the construction staging at the south end of the project that overlaps with North Link (see Parking Impact below), potential locations for construction staging, parking, and access are summarized below.

- A staging and parking area would be located north of NE Northgate Way between the I-5 on-ramp and 1st Avenue NE. The northbound on-ramp from 1st Avenue NE to I-5 would remain open, but with periodic nighttime closures. Construction access would be from 1st Avenue NE, from NE Northgate Way on the south side, and from the northbound on-ramp on the north side of NE Northgate Way. North of NE Northgate Way, construction access would be from 1st Avenue NE. At NE 117th Street (on the east side of I-5 north of the overcrossing), construction access to the guideway construction would be from the north end of 1st Avenue NE.
- There could be a construction staging and parking area located between I-5 and 5th Avenue NE at NE 123rd Street. Trucks would access the staging area from 5th Avenue NE.
- Construction of the light rail alignment north of NE 130th Street would occur in limited space, and would require intermittent one-lane closures on 5th Avenue NE. Construction staging and parking for the NE 130th Street Bridge would be located at the existing 5th Avenue NE/NE 133rd Street park-and-ride lot.
- At NE 145th Street the bus-only ramps would be used for truck access from I-5 to the construction site. Temporary paving along the guideway would provide access to construction areas on the south side. North of NE 145th Street there is a construction staging and parking area identified immediately north of the NE 149th Street cul-de-sac. Construction access could be from the cul-de-sac or temporary paved area along the guideway.
- In the vicinity of NE 155th Street the guideway could be built first and construction access could occur under the guideway. If not, truck access would be from I-5.

- North of NE 155th Street, the site for a future infiltration facility could be used to develop construction staging and parking. Between NE 159th Street and NE 161st Street, construction staging and parking could occur at the site of the future Ridgecrest Park with parking to be built along with this project. 1st Avenue NE at this location would be closed for 1 year. Temporary paving between the NE 149th Street staging area and NE 155th Street would provide construction access to this segment of the guideway. Some truck access could use local streets including NE 158th Street, NE 159th Street, and NE 161st Street.
- The King County Metro bus bay ramps would be used for construction access from approximately NE 161st Street to NE 165th Street. South of NE 174th Street there is local roadway reconstruction of 1st Avenue NE, which would also be used for construction staging and parking.
- North of NE 175th Street construction access would be from the I-5 northbound ramp. There would be temporary nighttime and one weekend lane closure on the ramps as the guideway is constructed over NE 175th Street. These areas would be used for construction staging and parking. City street access could occur from NE 180th Street, although temporary paving would be used to maximize access from the NE 175th Street I-5 ramps and along the guideway.
- Between NE 180th Street and NE 185th Street, 5th Avenue NE/7th Avenue NE would be reconstructed along with construction of the guideway. This activity would provide space for construction staging, parking, and access.
- In the vicinity of the NE 185th Street Station, the planned infiltration pond and the park-and-ride provide opportunities for phased construction staging and parking areas. Temporary paving would provide access along the guideway construction north of NE 185th Street within Segment A.

Transit Impacts

In Segment A, buses and transit riders traveling northbound on I-5 could be affected by the decrease in capacity and due to construction activity in the freeway right-of-way. For some alternatives and increase in delay would result from the narrower lanes and shoulder widths. Bus schedules could also be less reliable as congestion and delay increase.

For Alternative A1 a 1-month closure of one lane of I-5 in each direction for replacement bridges over I-5, transit could also have increased travel time impacts, although maintaining an HOV lane could reduce these impacts.

Construction of the light rail alignment in the vicinity of multiple arterials used by transit could affect those services as described for each alternative below. Changes to bus stop locations could be identified for maintaining safety during preparation of the Management of Traffic Plan.

Parking Impacts

Impacts to the park-and-ride lots at the stations are described for the station within each alternative in the following sections. Several scenarios are under development to maintain parking supply combined with other strategies to shift demand or encourage transfer to other modes.

A construction staging area will be established on a private surface parking lot at the south end of the project that will be used by both the North Link project and the Lynnwood Link project. The lot is associated with the Northgate Mall and is on the east side of 1st Avenue across from the I-5 ramps (North 107th Street vicinity). An agreement with the property owner will be prepared for the North Link project and extended for the Lynnwood Link project.

Streets reconstructed due to construction of the guideway or stations, that have on-street parking, would be impacted with a temporary loss of parking.

Nonmotorized Impacts

Nonmotorized traffic would not be affected due to construction within the I-5 alignment in Segment A. Impacts from the reconstruction of stations and freeway overcrossings are described by alternative. Nonmotorized traffic would be affected by construction activity on local streets.

6.2.1 Preferred Alternative: At-grade/Elevated with NE 145th and NE 185th Street Stations

The description of construction impacts for the Preferred Alternative begins with a description of general purpose traffic impacts along the alignment that are more specific to the Preferred Alternative including a description of construction staging, transit, parking, and non-motorized impacts. Following that are descriptions of construction impacts associated with the stations.

General Purpose Traffic Impacts

The at-grade/elevated alignment would require reconstruction of the NE 130th Street interchange and 5th Avenue NE, including a braided northbound off-ramp with 5th Avenue NE, to accommodate the light rail under NE 130th Street adjacent to I-5. Construction of the NE 130th Street bridge is proposed as a two-phase construction where half of the new bridge (two lanes wide) is constructed while the existing bridge remains in operation for the first phase. The second phase would demolish the existing bridge and complete the second half of the bridge. This activity would close one lane in each direction on the bridge for approximately 18 months. The current design does not include a center column, which means that the bridge girder would be put in place at night with a full closure of I-5. Demolition of the NE 130th Street bridge would require a weekend full closure of I-5. The

duration of closure also depends on the final design and construction method. For example, demolition of the northbound span could occur one night and the southbound span a second night. However, further investigation of the bridge structure and construction sequencing is required before there is a commitment to this option.

Following construction of the NE 130th Street overcrossing of I-5, construction of the 5th Avenue NE braid could take 1 year and would close southbound traffic on 5th Avenue NE from NE 125th Street to NE 130th Street. Local north-south traffic (all modes) could detour along 8th Avenue NE between NE 125th Street and Roosevelt Way NE. The northbound off-ramp would be kept open throughout construction. There would also be periodic weekend and daytime off-peak closures of 5th Avenue NE.

Diversion and detours to other interchanges (NE 145th Street and Northgate Way interchanges) would be expected for access to I-5 and east-west traffic circulation. Traffic on 5th Avenue NE could divert and detour to 15th Avenue NE east of I-5, and to 1st Avenue NE west of I-5. The light rail guideway and construction staging would displace the existing park-and-ride facility.

Two sections of 1st Avenue NE would be reconstructed for continued local access along the guideway construction—from NE 158th Street to NE 161st Street and from NE 170th Street to NE 174th Street. 1st Avenue NE and NE 170th Street would be configured as temporary dead end residential streets during construction. Property access would be maintained throughout construction, and traffic circulation, although constrained, would be available.

In the vicinity of the NE 185th Street Station, the planned infiltration pond and the park-and-ride provide opportunities for phased construction. The reconstruction of 5th Avenue NE/7th Avenue NE would result in short-term closures. Construction of the pedestrian walkway as an extension of the NE 185th Street bridge would be constructed with temporary nighttime closures of I-5. The NE 185th Street bridge would be reduced to one lane for 9 to 12 months. During final design and the preparation of the Maintenance of Traffic Plan, there could be a decision to close the NE 185th Street bridge to accelerate construction and reduce the time that the bridge capacity is reduced.

Construction phasing would occur such that no more than one overcrossing of I-5 has lane closures at one time throughout Segment A to preserve adequate east-west arterial capacity and non-motorized access across I-5 during construction.

Transit Impacts

With the Preferred Alternative, King County Metro Routes 242 and 243, on 5th Avenue NE north of NE 130th Street, could be affected by an increase in travel time

due to temporary lane closures southbound on 5th Avenue NE. King County Metro subscription bus routes that serve Lakeside High School (986, 987, and 995) would be affected by temporary lane closures and longer-term bridge closures on NE 130th Street. Bus stops on both sides of 5th Avenue NE, north of NE 130th Street, would be maintained or relocated.

Parking Impacts

The NE 133rd/5th Avenue NE Park-and-Ride, with 46 spaces, is approximately 700 feet north of the NE 130th Street Station. This park-and-ride, which is currently underutilized at 25 percent utilization, would be closed during construction and upon completion of the light rail alignment for the at-grade alternatives. Park-and-ride users would need to use other park-and-ride lots or change their mode of access to transit during construction.

Nonmotorized Impacts

The NE 115th Street access to the NE 117th Street overcrossing of I-5 could be closed for about 1 year. Pedestrian and bicycle access would be from 1st Avenue NE.

NE 145th Street Station (elevated)

General Purpose Traffic Impacts

With the Preferred Alternative, the elevated guideway would have columns close to 5th Avenue NE and cross the northbound off-ramp from I-5. NE 145th Street would remain open during construction of the guideway, but the traffic signals may need to be modified at the intersection of NE 145th Street and 5th Avenue NE. Traffic lanes on 5th Avenue NE could be reduced to one lane in each direction during construction of the station and park-and-ride facility.

Transit Impacts

King County Metro Route 242 on 5th Avenue NE, and Routes 373 and 347 on NE 145th Street would be affected by an increase in travel time due to temporary lane closures southbound on 5th Avenue NE and nearby construction activity.

King County Metro Routes 304 and 308 that travel on I-5 to the south of NE 145th Street and then exit at NE 145th Street to travel on NE 145th Street would also be affected by an increase in travel time due to narrow shoulders and lanes on I-5 and then construction activity at NE 145th Street.

The bus stop at the I-5 off-ramp terminal south of NE 145th Street could be maintained or moved to the south on 5th Avenue NE, depending on construction phasing.

Parking Impacts

The North Jackson Park Park-and-Ride, with 68 spaces, is located in the northwest quadrant of the I-5 northbound on-ramp and 5th Avenue NE. This park-and-ride would be closed for construction staging with the Preferred Alternative. This facility is currently well utilized at 96 percent utilization. Temporary replacement parking will be considered during each phase of construction to accommodate these users. Otherwise, park-and-ride users would need to use other park-and-ride lots or change their mode of access to transit during construction.

Nonmotorized Impacts

Pedestrians would be limited to travel on the east side of 5th Avenue NE through the construction activity area. This restriction would avoid pedestrians crossing the high volume of northbound traffic turning left to the I-5 on-ramp. Pedestrians would be directed to a safe crossing location north of the construction activity. Bicyclists would travel in mixed traffic.

NE 185th Street Station Option 1 (at-grade)

General Purpose Traffic Impacts

With the Preferred Alternative construction of the pedestrian bridge on the north side of the NE 185th Street bridge would require temporary nighttime closures of I-5 one direction at a time, with detours to the surface street network. Other alternatives could require construction in the median of I-5 which could require closure of one lane in each direction. This could be either nighttime closures or 24-hour closures for up to 1 month, depending on final design and final construction method.

Construction of the NE 185th Street overcrossing of the light rail guideway (where the guideway crosses under NE 185th Street) would require closing one lane for 9 to 12 months. Flaggers would guide eastbound and westbound traffic flow, one direction at a time. Nighttime construction activity could occur with only one direction open to travel. One direction of traffic could detour to NE 175th Street. Alternatively, NE 185th Street could be closed in both directions for a shorter duration.

5th Avenue NE would be reconstructed north of NE 185th Street in conjunction with the construction of the parking garage west of I-5. Intermittent daytime closures of one lane could be expected. This reconstruction could be completed in advance of the new NE 185th Street bridge over I-5 to allow for west side circulation to continue when the bridge over I-5 is closed. Reconstruction of 7th Avenue NE south of NE 185th Street would also be required for the Preferred Alternative and could be completed in advance of the guideway construction approaching the station from the south. The early relocation of both segments of

7th Avenue NE/5th Avenue NE would allow for local circulation near the NE 185th Street alignment reconstruction.

Transit Impacts

King County Metro Route 348 would use a detour route (potentially NE 175th Street) during the closure of one lane in each direction on NE 185th Street. Existing bus stops on NE 185th Street could be maintained or relocated during construction.

Parking Impacts

There is currently no park-and-ride in the NE 185th Street Station area; therefore, no impacts are expected.

Nonmotorized Impacts

Station construction would require sidewalk closures in the vicinity. Pedestrians would be re-routed as needed to maintain adequate pedestrian access and circulation in the area.

6.2.2 Alternative A1: At-grade/Elevated with NE 145th and NE 185th Street Stations

The discussion of each alternative presents expected impacts of construction where it differs from the Preferred Alternative. Alternatives will be compared to similar alternatives where both differ from the Preferred Alternative.

General Purpose Traffic Impacts

Construction would temporarily close the NE 117th Street crossing over I-5 for 9 to 12 months, depending on the final design and construction method. I-5 would be closed at nighttime for one direction at a time, with detours to the surface street network. The construction work would affect 1st Avenue NE north of Northgate Way and would require a staging area near 1st Avenue NE and NE 117th Street on the west side of I-5. The northbound on-ramp from 1st Avenue NE to I-5 would remain open.

For reconstruction of the NE 130th Street overcrossing a potential 1-month closure of a northbound and southbound I-5 traffic lane due to median construction would adversely affect I-5 operations for general purpose traffic, trucks, and buses.

However, further design of the Preferred Alternative has shown that the overcrossing can be constructed with a single span with lane closures limited to periodic night time and weekend closures. One lane would be closed in each direction on the NE 130th Street bridge during construction for approximately 18 months.

Transit Impacts

Impacts would be similar to the Preferred Alternative.

Parking Impacts

Impacts would be similar to the Preferred Alternative.

Nonmotorized Impacts

Pedestrian and bicycle access across I-5 would be limited to NE Northgate Way during the closure of NE 117th Street, approximately 0.33 mile to the south. Advance information would be provided to pedestrians and bicyclists.

NE 145th Street Station Option 1 (elevated)

Impacts would be the same as the Preferred Alternative.

NE 185th Street Station Option 1 (at-grade)**General Purpose Traffic Impacts**

Construction of the at-grade center-platform station for Alternative A1 would require reconstruction of the NE 185th Street bridge over I-5, which could be closed for 9 to 12 months, depending on final design and final construction method. I-5 would be closed at nighttime for one direction at a time, with detours to the surface street network. Construction in the median of I-5 could require closure of one lane in each direction. This could be either nighttime closures or 24-hour closures for up to 1 month, depending on final design and final construction method.

Construction impacts with reconstruction of 5th Avenue NE north of NE 185th Street and 7th Avenue NE south of NE 185th Street would be similar to the preferred alternative.

Transit Impacts

King County Metro Route 348, on NE 185th Street, would need to use a detour route (potentially NE 175th Street) during the closure of NE 185th Street. Existing bus stops on NE 185th Street would be maintained or relocated during construction.

Parking Impacts

There is currently no park-and-ride lot at NE 185th Street; therefore, no transit-related parking impacts are expected.

Nonmotorized Impacts

The NE 185th Street bridge could be reconstructed before or after the replacement of the NE 195th Street pedestrian bridge for Alternative A1 so as to maintain east-

west nonmotorized crossings of I-5 in the general vicinity. (Segment B alignment options require replacement of the NE 195th Street pedestrian/bicycle bridge, approximately 0.50 mile to the north.)

Station construction will require sidewalk closures in the vicinity. Pedestrians would be re-routed as needed to maintain adequate pedestrian access and circulation in the area.

6.2.3 Alternative A3: Mostly Elevated with NE 145th and NE 185th Street Stations

Impacts along the guideway would be similar to the Preferred Alternative but without reconstructing the NE 117th Street bridge and NE 130th Street, and avoiding reconstruction of some local streets as well due to the mostly elevated guideway. 1st Avenue NE in the vicinity of NE 175th Street would be realigned and reconstructed resulting in short-term and long-term closures.

NE 145th Street Station

Construction impacts at the NE 145th Street Station with Alternative A3 would be the same as with Alternative A1.

NE 185th Street Station

Construction of the elevated station, parking structure, and bus facility would require site access from NE 185th Street and 8th Avenue NE. NE 185th Street would remain open for one lane of traffic in each direction during construction. Local access for some residential properties could be temporarily affected during construction activities.

Transit and nonmotorized movements would be affected by Alternative A3 construction less than with Alternative A1 because there would be no need to reconstruct NE 185th Street over I-5. Pedestrian and bicycle circulation impacts east of I-5 would be similar to Alternative A1.

6.2.4 Alternative A5: At-grade/Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Construction of the Alternative A5 alignment would be similar to the Preferred Alternative. The NE 130th Street bridge closure with Alternative A5 would have the same impacts as with Alternative A1.

NE 130th Street Station

General Purpose Traffic Impacts

At-grade station construction would require reconstruction of the west half of 5th Avenue NE, north of NE 130th Street, as a cantilever over the proposed station.

This reconstruction would disrupt traffic on 5th Avenue NE because the roadway would likely need to be closed and/or narrowed to one lane during construction.

Transit Impacts

King County Metro Routes 242 and 243, on 5th Avenue NE in the vicinity of the 130th Street Station, would be affected by an increase in travel time due to temporary lane closures southbound on 5th Avenue NE. King County Metro subscription bus routes serving Lakeside High School (986, 987, and 995) travel on NE 130th Street. These buses would be affected by temporary lane closures and longer-term bridge closures on NE 130th Street. Bus stops on both sides of 5th Avenue NE, north of NE 130th Street, would be maintained or relocated.

Parking Impacts

The NE 133rd/5th Avenue NE Park-and-Ride, with 46 spaces, is approximately 700 feet north of the NE 130th Street Station. This park-and-ride, which is currently underutilized at 25 percent utilization, would be closed during Alternative A5 construction and upon completion of the alignment. Park-and-ride users would need to use other vicinity park-and-ride lots or change their mode of access during construction.

Nonmotorized Impacts

The closure of the NE 133rd/5th Avenue NE Park-and-Ride lot could reduce some pedestrian activity. Pedestrians traveling to bus stops in the vicinity of NE 130th Street would need to be informed of a safe crossing location on the east side of 5th Avenue NE in advance of the station area construction. The crossing should take into account the vertical curve, which limits sight distance north of the end of the sidewalk. Bicyclists would travel in mixed traffic.

Closure of the NE 130th Street bridge means that pedestrians and bicyclists would detour to the NE 117th Street crossing of I-5, approximately 1 mile to the south; Northgate Way crossing of I-5, approximately 1.3 miles to the south; or to NE 145th Street, approximately 0.75 mile to the north.

NE 155th Street Station

General Purpose Traffic Impacts

Construction of the NE 155th Street Station and park-and-ride structure would affect NE 155th Street with intermittent lane closures during Alternative A5 construction. Emergency vehicle access and response to and from the adjacent Shoreline Fire Station 65 must be maintained throughout construction.

Transit Impacts

One-lane operations and periodic lane restrictions on NE 155th Street could result in delays for King County Metro Route 330.

Parking Impacts

There is currently no park-and-ride lot at the NE 155th Street Station and therefore no impacts.

Nonmotorized Impacts

Construction of the bus loading/unloading areas adjacent to NE 155th Street could cause long-term closures to pedestrian travel along one side of NE 155th Street, followed by the same closures on the other side of the street. Pedestrians would be directed to travel on one side of NE 155th Street at the nearest intersection. Intermittent lane closures during Alternative A5 construction would also affect the bicycle lane with intermittent closures. Space for construction activity could reduce access to the bicycle lane but would be minimized wherever possible.

NE 185th Street Station

General Purpose Traffic Impacts

With Alternative A5, the at-grade NE 185th Street Station would require cut-and-cover construction of a structure under NE 185th Street at the south approach to the station, which would require closing NE 185th Street for approximately 1 month. Construction of the station, bus facility, and park-and-ride at the station area would affect traffic on NE 185th Street and 8th Avenue NE, but two-way traffic could be maintained on both roadways (after completing the cut-and-cover work for the guideway under NE 185th Street). Reconstruction of 5th Avenue NE south of NE 185th Street must be completed before construction of the guideway approach from the south to maintain local street circulation and access throughout construction. Surface park-and-ride construction under the Seattle City Light power lines would require access to both NE 185th Street and 10th Avenue NE.

Transit Impacts

During Alternative A5 construction, King County Metro Route 348 would be similarly affected as with the Preferred Alternative, except that the closure of NE 185th Street would be of shorter duration (approximately 1 month). Route 348 could use a detour route along NE 175th Street.

Parking Impacts

There is currently no park-and-ride lot at the NE 185th Street Station area and therefore no impacts.

Nonmotorized Impacts

Impacts on nonmotorized movements with Alternative A5 would be the same as with the Preferred Alternative.

6.2.5 Alternative A7: Mostly Elevated with NE 130th, NE 155th, and NE 185th Street Stations

Construction impacts of the Alternative A7 elevated alignment would be the same as with Alternative A3 south of NE 145th Street. Construction impacts of Alternative A7 would be the same as Alternative A5 from NE 145th Street to the north.

NE 130th Street Station

Construction impacts of the NE 130th Street station would be the same as those for Alternative A5.

NE 155th Street Station

Construction impacts at the NE 155th Street Station with Alternative A7 would be the same as with Alternative A5.

NE 185th Street Station

Construction impacts at the NE 185th Street Station with Alternative A7 would be the same as with Alternative A5.

6.2.6 Alternative A10: At-grade/Elevated with NE 130th, NE 145th, and NE 185th Street Stations

The at-grade/elevated alignment for Alternative A10 would have similar impacts on the guideway construction as Alternative A5.

NE 130th Street Station

Construction impacts at the NE 130th Street Station with Alternative A10 would be the same as with Alternative A5.

NE 145th Street Station

Construction impacts at the NE 145th Street Station with Alternative A10 would be the same as with Alternative A1.

NE 185th Street Station

Construction impacts at the NE 185th Street Station with Alternative A10 would be the same as with Alternative A5.

6.2.7 Alternative A11: Mostly Elevated with NE 130th, NE 145th, and NE 185th Street Stations

Construction impacts of the Alternative A11 elevated alignment would be similar to Alternative A3.

NE 130th Street Station

Construction impacts at the NE 130th Street Station with Alternative A11 would be the same as with Alternative A7.

NE 145th Street Station

Construction impacts at the NE 145th Street Station with Alternative A11 would be the same as with Alternative A1.

NE 185th Street Station

Construction impacts at the NE 185th Street Station with Alternative A11 would be the same as with Alternative A3.

6.3 Segment B: Shoreline to Mountlake Terrace

General Purpose Traffic Impacts

The light rail alignment adjacent to the east side of I-5 between NE 195th Street and the I-5/SR 104 interchange northbound off-ramp would be constructed within the WSDOT right-of-way. For some alternatives, shoulders through this section could be reduced and a concrete barrier installed to define the work zone along the freeway. The decrease in width and the duration of shoulder use would be minimized. Construction access to this segment would occur from NE 195th Street and the I-5/SR 104 interchange ramps.

Installation of the bridge girder over I-5 would occur at night with a full closure of I-5. Construction through the SR 104 interchange area would include construction work within the cloverleaf interchange. This activity could have some effect on traffic operations due to the proximity of construction near the interchange ramps. Nighttime closures of ramps would also occur as the guideway construction crosses over the ramps. Other periodic nighttime closures of I-5 could occur for delivery of materials to construction sites.

North of the Mountlake Terrace Station, Segment B alternatives that cross over to the west side of I-5 would involve constructing a multi-foundation support system (straddle bents) that would likely require falsework and cast-in-place construction. Nighttime closures of I-5 would likely be necessary to install the straddle bents and girders and construct the guideway bridges to cross to the median or to the west side of I-5. Other design and construction techniques will be explored through final design. I-5 traffic would be detoured to local streets for these nighttime closures. All Segment B alternatives cross over 212th Street SW, requiring staging and possible lane closures or nighttime full closures on that facility.

The Mountlake Terrace Freeway Station would be affected by all alternatives during construction. The Preferred Alternative and Alternatives B1 and B2A would require construction in the median of I-5 north of the existing Mountlake Terrace Freeway Station. This construction activity would require closure of the direct access bus ramps for 6 to 9 months. The ramp closure with Alternative B1 is required for column construction and placement of the elevated guideway over the ramps. It would also be affected by the retained fill section as the elevated guideway transitions to an at-grade alignment. The bus ramps can possibly be redesigned to allow the transit station to operate while the guideway is under construction. The length of time would be updated with new information as design details are further developed. The bus ramp closure with Alternatives B2A would be 6 to 9 months plus nightly closures for column construction and guideway placement over the I-5 mainline and ramps. The bus ramps would be permanently closed with Alternative B4 because the light rail station would replace the freeway bus stop. Table 6-2 summarizes roadway closures and duration for Segment B. Construction staging and parking would occur within the existing surface lot.

Table 6-2. Segment B: Roadway Closures and Duration

Roadway/Facility	Alternative			
	Preferred (B2 Modified)	B1	B2A Modified	B4
I-5 mainline northbound	♦	♦	♦	One lane each direction, 1 month
I-5 mainline southbound	♦	---	♦	One lane each direction, 1 month
NE 195th Street pedestrian/bicycle bridge	6 months	6 months	6 months	6 months
I-5 lane in vicinity of NE 195th Street	Full nighttime closure to place girder	6 months	6 months	6 months
Direct access bus ramps and freeway station	6-9 months + nighttime closures	6-9 months + nighttime closures	6-9 months + nighttime closures	Permanently closed
SR 104/NE 205th Street	♦	♦	♦	♦

Table 6-2. Segment B: Roadway Closures and Duration

Roadway/Facility	Alternative			
	Preferred (B2 Modified)	B1	B2A Modified	B4
236th Street SW	◆	◆	◆	---
228th Street SW	1 month	---	1 month	---
220th Street SW	◆	---	◆	---
212th Street SW	◆	◆	◆	---
60th Avenue West	6-month closure	6-month closure	6-month closure	---

◆= Periodic nighttime and weekend shoulder or lane closures of I-5, I-5 ramps, and periodic street closures.

◆◆= Nighttime, more frequent; the alternative would result in more frequent nighttime closures than other alternatives. Crossing both I-5 northbound and southbound lanes all at once would result in less frequent nighttime closures.

--- Not affected by alternative.

Construction Staging, Parking, and Truck Access

Construction staging and access would be from a series of locations along Segment B. Potential locations for construction staging, parking, and access are summarized below.

- In the vicinity of the NE 195th Street pedestrian/bicycle bridge over I-5, construction staging and parking would occur at each end of the bridge, within the WSDOT right-of-way. Access would be from the city streets ending at the bridge on both sides.
- In the vicinity of the NE 205th Street/SR 104 interchange, construction staging would occur within the spaces at the interchange. Truck access would be from the ramps. The contractor would provide employee shuttles to the construction site.
- Between NE 195th Street and NE 205th Street, temporary paving would provide access along the guideway alignment during construction.
- North of NE 205th Street, a future infiltration pond would provide construction access, and in the vicinity of 236th Street SW a future roadway alignment by the City of Mountlake Terrace could provide additional construction staging. Access would be provided from the I-5 northbound ramp and 236th Street SW.
- At the Mountlake Terrace Transit Center Station, construction staging would use the existing surface parking lot, resulting in a temporary loss of 205 parking spaces during construction.
- At the Mountlake Terrace Transit Center Station, construction vehicle and employee access would be from 236th Street SW.
- Where the guideway crosses I-5, construction staging would be provided on both sides of I-5. On the east side a temporary roadway would be constructed and access would be from the transit center. This roadway would expand the footprint of the construction for the guideway by about 20 feet on both sides due to the challenges of construction within the slope.

- On the west side, a future infiltration pond site would be used for construction staging. Access would be provided from the I-5 shoulder due to the lack of streets near the west side of I-5 and the slope going up to the west. Potential access from 232nd Street SW could be considered during final design.
- In the vicinity of 220th Street SW, station construction staging would be within the station area and within the interchange area. For the 220th Street Station North Side Option 60th Avenue West would be fully closed for approximately 6 months to accommodate construction staging, parking, and access. Adequate access to the properties west of 60th Avenue West is available and would be preserved. This staging area would serve the guideway construction to the north.
- Construction staging and parking would occur where 58th Avenue West ends at the I-5 right-of-way. This area would have multiple construction activities in addition to guideway construction, such as providing high rail vehicle access, raising power transmission lines, installing a signal/communications bungalow, and constructing a guideway crossover. Additional staging and construction parking would occur at the future detention pond site within the triangular area at 212th Street SW and I-5. Construction access would be from 212th Street SW and along the guideway.

Transit Impacts

Buses and transit riders traveling northbound on I-5 could be affected by the decrease in capacity and increase in delay that would be caused by the narrower lanes and shoulder width where the light rail alignment is adjacent to I-5 on the east side (south of the Mountlake Terrace Transit Center). Buses using the direct access ramps at the Mountlake Terrace freeway station would be rerouted onto local streets during closure of the ramps.

Parking Impacts

Currently, on-street parking is not available along Segment B alignments; therefore, there would be no on-street parking impacts.

Nonmotorized Impacts

The NE 195th Street pedestrian/bicycle bridge would be closed for approximately 6 months. The reconstruction of the NE 185th Street overcrossing, approximately 0.50 mile south of the NE 195th Street pedestrian bridge in Segment B, could be completed before or after the closure of the NE 195th Street bridge to maintain nonmotorized access across I-5.

6.3.1 Preferred Alternative (B2 Modified): Mountlake Terrace Transit Center Station

General Purpose Traffic Impacts

General purpose traffic would be somewhat affected by construction activity on 236th Street SW to and from the south and the station. There would be periodic nighttime and weekend closures of I-5, I-5 lanes, and I-5 ramps. There would also be night time or weekend street closures of 236th Street SW, and 228th Street SW on the west side of I-5, for construction of the guideway over the roadway. There could be periodic lane closures on 236th Street SW for moderate reconstruction activities adjacent to the station.

Construction of the guideway in retained cut or fill sections could require work space and staging in the WSDOT I-5 right-of-way, along the southbound lanes. There could be reduced shoulders for southbound I-5. The width and duration would be minimized or eliminated. This will be determined through final design and preparation of the WSDOT Maintenance of Traffic Plan. Reconstructing the roadway could close 228th Street SW for 1 month.

Transit Impacts

Construction of the Preferred Alternative would require closure of the freeway station and freeway bus ramps for approximately 6 to 9 months. A plan for rerouting buses could include buses that are rerouted to the park-and-ride or remain on I-5, and skip the Mountlake Terrace Freeway Station for buses with few riders accessing the Freeway Station.

Parking Impacts

Construction of the Mountlake Terrace Transit Center Station would require closing the surface park-and-ride lot that contains approximately 205 spaces; the parking garage would remain open throughout construction. Bus circulation may be constrained but not restricted during construction. Provision of temporary replacement parking nearby would be investigated. There is a surface lot in the southwest corner of the site with 20 spaces that could also be closed during construction.

Nonmotorized Impacts

Construction would disrupt pedestrian and bicycle travel during construction activities adjacent to 236th Street SW. Pedestrian and bicycle circulation would be affected with the short-term closure of 228th Street SW.

220th Street SW Station South Option (elevated)

The Preferred Alternative could be constructed with a station south of 220th Street. Construction site access for the station could be from 222nd Street SW, 220th Street SW and the southbound on-ramp. Construction staging and employee parking would occur on-site. The guideway would be elevated at the station and over 220th Street SW. During construction, transit on 220th Street SW could experience some delay and bus stops could be temporarily relocated. Pedestrian and bicycle travel along 220th Street SW would be maintained during construction.

6.3.2 Alternative B1: Mountlake Terrace Transit Center Station**General Purpose Traffic Impacts**

Access to the Mountlake Terrace Transit Center would be disrupted in the short term during Alternative B1 construction, with short-term impacts on general purpose traffic, transit, and nonmotorized travel.

Transit Impacts

As indicated above, there would be approximately a 6 to 9 month closure of the freeway bus ramps to the existing Mountlake Terrace Freeway Station for construction of the alignment in the median on the north side of the Freeway Station. Buses could be rerouted to the Mountlake Terrace Park-and-Ride to drop off and pick up passengers, resulting in additional travel time. Buses with few users of the freeway stop could remain on I-5 and skip the existing Mountlake Terrace Bus Freeway Station.

Parking Impacts

Construction of the Mountlake Terrace Transit Center Station would require closing the surface park-and-ride lot that contains approximately 205 spaces; the parking garage would remain open throughout construction. Bus circulation could be constrained but not restricted during Alternative B1 construction. Provision of temporary replacement parking nearby will be investigated.

Nonmotorized Impacts

Construction of the bus loading/unloading areas on 236th Street SW would interrupt pedestrian and bicycle travel. Construction phasing could ensure that one sidewalk is open on one or the other side of the street at all times.

There is no sidewalk on the south side of the 236th Street SW bridge. Pedestrians would be directed to cross at the signalized intersection of 236th Street SW and the transit center entrance so that they can use the sidewalk on the north side of the bridge.

6.3.3 Alternative B2A (Modified): Mountlake Terrace Transit Center Station with 220th Street SW Station North Option

General Purpose Traffic Impacts

General purpose traffic would be affected by Alternative B2A the same as with the Preferred Alternative at the Mountlake Terrace Transit Center Station.

Transit Impacts

Construction of Alternative B2A would require closure of the freeway station and freeway bus ramps for 6 to 9 months, the same as for the Preferred Alternative. A plan for rerouting buses could include buses that are rerouted to the park-and-ride or remain on I-5, and skip the Mountlake Terrace Freeway, the same as for the Preferred Alternative.

Parking Impacts

Impacts to the surface park-and-ride would be similar to the Preferred Alternative.

Nonmotorized Impacts

Construction would disrupt pedestrian and bicycle travel, similar to the Preferred Alternative.

220th Street SW Station North (elevated)

The southbound ramps would be relocated to the east before construction of the 220th Street SW Station and guideway begins so that the ramp traffic can proceed uninterrupted. Construction site access for the station could be from the old ramps. Construction site access for the park-and-ride garage would be from 60th Avenue West. 60th Avenue West would be fully closed for approximately 6 months to accommodate construction staging, parking, and access. Adequate access to the properties west of 60th Avenue West is available and would be preserved. The guideway would be elevated at the station and over 220th Street SW. During construction, transit could experience some delay and bus stops could be temporarily relocated. Pedestrian and bicycle travel on 220th Street SW and the freeway overcrossing would be maintained during construction.

6.3.4 Alternative B4: Mountlake Terrace Freeway Station

General Purpose Traffic Impacts

The Mountlake Terrace Freeway Station would require work space within the I-5 median by reducing inside shoulder width for both northbound and southbound I-5. Construction of the guideway crossing I-5 to the median would require the closure

of one lane on I-5 in each direction for 1 month to provide space for installing the columns for the guideway bridge. Nighttime closures of I-5 would require detours onto surface streets for northbound freeway traffic. North of the freeway transit station, impacts with Alternative B4 would be similar to Alternative B1.

Transit Impacts

The bus ramps would be permanently closed with Alternative B4 because the light rail station would replace the freeway bus stop. Construction activities would be adjacent to the HOV lane and would therefore affect capacity and travel speed for vehicles and buses using the lane.

Parking Impacts

Impacts to the surface park-and-ride would be similar to the Preferred Alternative.

Nonmotorized Impacts

Nonmotorized travel would not be affected by the construction of the freeway station.

6.4 Segment C: Mountlake Terrace to Lynnwood

Two scenarios exist for all Segment C alternatives in terms of how they connect with Segment B alternatives. If connecting with the Preferred Alternative or Alternative B2A, the guideway in Segment C would be located on the west side of I-5. If connecting with Alternative B1 or B4, the guideway in Segment C would be located in the median of I-5. The elevated guideway along I-5 could require shoulder and lane width reductions to provide the work zone. When in the median, crossing the southbound lanes of I-5 would involve constructing straddle bents, which would require nighttime closures of southbound I-5 traffic to install girders for the guideway bridge. Nighttime closures on I-5 would require detours onto surface streets. Nighttime closures would also be necessary where the guideway crosses over local streets and the Interurban Trail. Table 6-3 summarizes the roadway closures and duration in Segment C.

Table 6-3. Segment C: Roadway Closures and Duration

Roadway	Alternative			
	Preferred Alternative (C3 Modified)	C1	C2	C3
I-5 mainline southbound ^a	◆	◆	◆	◆
52nd Avenue West	◆	◆	◆	◆
208th Street SW	◆	◆	◆	◆
204th Street SW	◆	◆	◆	◆

Table 6-3. Segment C: Roadway Closures and Duration

Roadway	Alternative			
	Preferred Alternative (C3 Modified)	C1	C2	C3
200th Street SW, west of 48th Avenue West to 44th Avenue West	◆	◆	----	◆
Interurban Trail	☐ and detour	☐ and detour	☐ and detour	☐ and detour
48th Avenue West	◆	◆	◆	◆
46th Avenue West	◆	◆	◆	◆
44th Avenue West	◆	◆	◆	◆
I-5 HOV Direct Access Ramps	◆	◆	◆	◆
I-5 southbound on-ramp at 44th Avenue West	◆	----		----

^a These nighttime closures would occur for connecting to Segment B I-5 median alignments only.

◆ = Periodic nighttime, weekend, and shoulder or lane closures of I-5, I-5 ramps, and periodic street closures.

--- Not affected by alternative.

General Purpose Traffic Impacts

Construction of the elevated guideway over 52nd Avenue West would require nighttime closures of this roadway. The elevated guideway west of I-5 approaching the Lynnwood Park-and-Ride would cross over 208th Street SW and private properties, which would require construction easements. The project would include reconstruction of 208th Street SW and possibly some access roads. The alignment would cross the Interurban Trail at its intersection with 208th Street SW. Trail and roadway access would be maintained.

The guideway would then cross the 46th Avenue West direct access ramps to I-5. Nighttime closures would be needed to complete the guideway across the ramp facility. The guideway/tail track would extend east of 44th Avenue West, and construction would require nighttime closures of 44th Avenue West to install the guideway structure. Reconstruction of 48th Avenue West would result in partial roadway closures days and nights, as well as lane closures. Detours for north-south traffic could include 52nd Avenue West. A detour for the I-5 ramp traffic may include using 204th Street SW east of 44th Avenue West to connect to the 196th Street SW interchange.

The guideway would require reconstructing 208th Street SW at the east end, where it functions as a minor road providing access to industrial properties and a substation. Nighttime closures would be required to construct the guideway over 208th Street SW.

Traffic access to the transit center and parking garage would be maintained during construction of the Lynnwood Park-and-Ride Station.

The tail track east of the light rail station would be constructed over 44th Avenue West and the Interurban Trail. The construction would result in temporary lane closures and some nighttime full closures. Construction activity over the Interurban Trail would require the same detour as discussed above.

Construction Staging, Parking, and Truck Access

For the segment from 52nd Avenue NE to the Interurban Trail, construction staging and parking could occur within a large area designated for a future PUD substation and along the guideway. Construction access would occur from 52nd Avenue West and 208th Avenue West. The area proposed for future school district development on the north side of the Interurban Trail would also accommodate construction staging and parking.

Construction for the median alignment would occur within the median with access also occurring from 52nd Avenue West and using 208th Street SW and 48th Street SW.

At the Lynnwood Transit Center, construction staging and parking would occur within the site with each phase of construction. Sound Transit would establish parameters for construction phasing and the contractor would develop a detailed construction phasing plan. Construction access would occur from city streets that are used to access the park-and-ride.

In the vicinity of the Lynnwood Transit Center Station, construction staging and parking would occur within the site. Construction vehicle access would occur from city streets and the HOV ramps.

Transit Impacts

Fifteen bus routes (12 Community Transit, 3 Sound Transit) travel to and from the Lynnwood Transit Center via I-5 using the direct access ramps. Constructing the guideway over the ramps would temporarily close the direct access ramps on nights and weekends. Community Transit routes operate from 6:00 am to 7:00 pm, and Sound Transit routes operate from 4:30 am to 12:15 am.

52nd Avenue West would be closed temporarily while the light rail is constructed in the I-5 median over this roadway. Community Transit Route 130 travels on 52nd Avenue West to 200th Street SW; this route does not operate past 10:00 pm.

The construction of the tail track beyond the station would extend over 44th Avenue West on which Community Transit Route 112 travels. The construction over this roadway would cause temporary lane closures and some nighttime full closures. Community Transit Route 112 does not operate past 10:00 pm.

Parking Impacts

There is currently no on-street parking on streets that would be affected by the Segment C alternative alignments; therefore, no on-street parking impacts are expected during construction of the alternative alignments. Impacts to park-and-ride facilities and private surface parking are described for each station alternative below.

Nonmotorized Impacts

Light rail would be constructed across the Interurban Trail in two locations: approximately 500 feet east of where the alignment leaves I-5, and over the Interurban Trail bridge at 44th Avenue West. The Interurban Trail would be closed during Alternative C3 construction. Detour planning could use streets such as Alderwood Mall Boulevard/200th Street SW to Cedar Valley Road, where there are bicycle lanes and sidewalks. Pedestrian and bicycle routes through the park-and-ride could be considered that connect to the Scriber Creek Trail. However, use of this latter option could require significant safety improvements.

6.4.1 Preferred Alternative (C3 Modified): Along I-5 to Lynnwood Park-and-Ride Station

General Purpose Traffic Impacts

Construction of the elevated guideway over 52nd Avenue West would require nighttime closures of this roadway. The elevated guideway west of I-5 approaching the Lynnwood Park-and-Ride would cross over 208th Street SW and private properties, which would require access during construction. The project would include reconstruction of 208th Street SW and possibly some access roads. The guideway would cross the Interurban Trail at its intersection with 208th Street SW. Trail and roadway access would be maintained.

The guideway would then cross the 46th Avenue West direct access ramps to I-5. Nighttime closures would be needed to complete the guideway across the ramp facility. The guideway/tail track would extend east of 44th Avenue West, and construction would require nighttime closures of 44th Avenue West to install the guideway structure. Detours for north-south traffic could include 52nd Avenue West. A detour for the I-5 ramp traffic could use 204th Street SW east of 44th Avenue West to connect to the 196th Street SW interchange.

The guideway would require reconstructing 208th Street SW at the east end, where it functions as a minor road providing access to industrial properties and a substation. Nighttime closures would be required to construct the guideway over 208th Street SW.

Traffic access to the transit center and parking garage would be maintained during construction of the Lynnwood Transit Center Station.

The tail track east of the light rail station would be constructed over 44th Avenue West and the Interurban Trail. The construction would result in temporary lane closures and some nighttime full closures.

Transit Impacts

Fifteen bus routes (12 Community Transit, 3 Sound Transit) travel to and from the Lynnwood Transit Center via I-5 using the direct access ramps. Constructing the guideway over the ramps would temporarily close the direct access ramps on nights and weekends. Community Transit routes operate from 6:00 am to 7:00 pm, and Sound Transit routes operate from 4:30 am to 12:15 am.

52nd Avenue West would be closed temporarily while the light rail is constructed in the I-5 median over this roadway. Community Transit Route 130 travels on 52nd Avenue West to 200th Street SW; this route does not operate past 10:00 pm.

The construction of the tail track beyond the station would extend over 44th Avenue West on which Community Transit Route 112 travels. The construction over this roadway would cause temporary lane closures and some nighttime full closures. Community Transit Route 112 does not operate past 10:00 pm.

Parking Impacts

Construction of the parking garage could result in a loss of up to 560 park-and-ride stalls during construction. Replacement parking would be provided through construction phasing of other surface parking lots and temporary parking could be provided within the project site on parcels acquired for the construction project. Sound Transit would prepare a parking technical memorandum to plan for temporary parking replacement during construction phases.

Park-and-ride users could also change their mode of access to the park-and-ride or use other park-and-rides, such as Swamp Creek or Mountlake Terrace. The extension of the eastbound right turn lane on South 200th Street, between 44th Avenue N and 48th Avenue North, would result in displacing parking along the north edge of the commercial parking area (refer to Section (5-7). Temporary replacement, restriping, and/or partial compensation could be provided to meet the existing demand for parking. Temporary parking during construction could be provided on nearby parcels acquired by Sound Transit for construction.

Nonmotorized Impacts

Light rail would be constructed across the Interurban Trail in two locations: approximately 500 feet east of where the alignment leaves I-5, and over the Interurban Trail bridge at 44th Avenue West. The Interurban Trail would be closed during Alternative C3 construction. Detour planning could use streets such as Alderwood Mall Boulevard/200th Street SW to Cedar Valley Road, where there are

bicycle lanes and sidewalks. Pedestrian and bicycle routes through the park-and-ride could be considered that connect to the Scriber Creek Trail. However, use of this latter option could require significant safety improvements.

6.4.2 Alternative C1: 52nd Avenue West to 200th Street SW Station

General Purpose Traffic Impacts

Alternative C1 construction activity on the east side of 52nd Avenue West could affect traffic operations with possible lane reductions to add space for installation of the column foundations and caps. The three-lane roadway could be reduced to two lanes to provide the space for construction, maintaining one lane of travel in each direction. Driveways to properties would also be closed for construction of the elevated guideway; however, access would be maintained throughout construction, which may require access through the construction site or neighboring properties.

Construction of the station adjacent to 200th Street SW could require nighttime closures and intermittent one-lane closures on the south side of the street. Most of the construction activity would occur south of the street. Construction of the guideway where it is adjacent to 200th Street SW, west of 48th Avenue West, could require nighttime closures of 48th Avenue West.

Transit Impacts

Community Transit Route 130 travels on 52nd Avenue West to 200th Street SW. This route does not operate past 10:00 pm and would therefore not be affected during nighttime closures after 10:00 pm.

Construction of the station on the south side of 200th Street SW could cause an increase in traffic congestion and delays to Community Transit Routes 115, 116, 130, 201, and 202.

Parking Impacts

Approximately 200 to 250 parking stalls would be displaced along the north side of the existing transit center during construction of the parking garage. The existing park-and-ride is 100 percent utilized. Temporary replacement parking in the vicinity would be investigated along with construction phasing. Otherwise, park-and-ride users would be required to change their mode of access to the park-and-ride or use other park-and-rides, such as the Swamp Creek or Mountlake Terrace.

Construction of the alignment and station would result in displacing parking along the north edge of the commercial parking area (refer to Section (5-7). Temporary replacement, restriping, and/or partial compensation could be provided to meet the

existing demand for parking. Temporary parking during construction could be provided on nearby parcels acquired by Sound Transit for construction.

Nonmotorized Impacts

The Interurban Trail is an on-street facility adjacent to 52nd Avenue West between 208th Street SW and the power line segments. Pedestrians and bicyclists using the trail in this section would need to detour to other surface streets, such as 54th Avenue West and 206th Street SW, during Alternative C1 construction.

Sidewalks could be closed along the east side of 52nd Avenue West and the south side of 200th Street SW during construction. Pedestrians could use the sidewalk on the opposite side of the street, and bicycles could either use the traffic lane or detour to the Interurban Trail.

6.4.3 Alternative C2: 52nd Avenue West to Lynnwood Transit Center

General Purpose Traffic Impacts

Construction impacts with Alternative C2 on the east side of 52th Avenue West would be the same as with Alternative C1. Access to and through the Lynnwood Park-and-Ride would be maintained throughout construction of the transit center station and parking garage.

Transit Impacts

46th Avenue West, which carries the I-5 bus routes to the direct access ramps, would be closed in the short term for guideway construction. Fifteen bus routes (12 Community Transit, 3 Sound Transit) travel between the Lynnwood Transit Center and I-5 using the direct access ramps. 46th Avenue West would be temporarily closed for construction of the guideway during nights and weekends. Community Transit routes operate from 6:00 am to 7:00 pm, and Sound Transit routes operate from 4:30 am to 12:15 am.

Parking Impacts

Construction of the parking garage would result in a loss of approximately 660 parking spaces during construction. Temporary replacement parking in the vicinity would be investigated along with construction phasing. Otherwise, park-and-ride users would be required to change their mode of access to the park-and-ride or use other park-and-rides, such as Swamp Creek or Mountlake Terrace. Alternatively, leasing parking spaces from nearby local private lots may also be considered.

Nonmotorized Impacts

Nonmotorized impacts would be the same as Alternative C1, except for the addition of Scriber Creek Trail closures.

6.4.4 Alternative C3: 52nd Avenue West to Lynnwood Transit Center

General Purpose Traffic Impacts

Construction impacts with Alternative C3 would be similar to the Preferred Alternative.

Transit Impacts

Construction impacts with Alternative C3 would be similar to the Preferred Alternative.

Parking Impacts

Approximately 1,100 stalls could be impacted during construction of the station and associated park-and-ride garage in both Options 1 and 2 of Alternative C3.

Construction phasing, temporary parking lots and early construction of the approximately 1,600-stall parking garage could reduce this impact.

Option 1 would use the existing transit center, while Option 2 would rebuild the transit center adjacent to the light rail station. The new transit center in Option 2 would be built before the existing transit center is removed to maintain transit connections at this location.

Nonmotorized Impacts

Construction impacts with Alternative C3 would be similar to the Preferred Alternative.

7 INDIRECT IMPACTS

This chapter discusses potential indirect transportation mobility impacts that would be caused by the Lynnwood Link Extension. Key observations and findings include the following:

- The Lynnwood Link Extension could help facilitate potential increases in residential and employment uses around project stations.
- These potential increases in land use density around stations could lead to changes in regional and local travel patterns because trips to and from these areas may increase for all modes, affecting transit, freeway and local traffic volumes, parking demand, and nonmotorized users.
- The light rail extension could also affect ridership on other transit service in the project corridor, particularly parallel bus rapid transit service in the SR 99 corridor, where longer distance trips could decrease as some riders shift to light rail, and shorter trips could increase as more riders use other transit service to access light rail.
- Other changes in transit service in the corridor in response to the light rail extension that are not yet planned or anticipated could also result in shifts in ridership. These could include the potential for Community Transit, Sound Transit, and King County Metro to redeploy and/or reinvest bus service that is replaced by light rail service. Also, ridership on Sounder North commuter rail service could be affected by the light rail extension.

7.1 Regional Context and Travel Patterns

The completion of the Lynnwood Link Extension would provide fast and reliable light rail service. Light rail service could help to facilitate potential increases in residential and employment uses around project stations. However, the potential for increased land use development is expected to be low to moderate for all stations, except for the Lynnwood Transit Center Station, based on the station area development potential ratings included in Chapter 4, Section 4.2, Land Use, of the Lynnwood Link Extension Draft EIS. However, these potential increases in land use development, regardless of level, could lead to corresponding changes in regional travel patterns as trips to and from these areas potentially increase for all modes.

7.2 Transit

The Lynnwood Link Extension could affect ridership levels on parallel transit service, particularly bus rapid transit service in the SR 99 corridor. Ridership on the RapidRide E Line could decrease as riders making longer commute trips shift to the light rail network. However, ridership could increase on the *Swift* bus rapid transit line when the route is extended south and east to terminate at the NE 185th Street Station, and more riders use *Swift* to access light rail.

In addition to the planned changes to local and commuter bus service assumed for the light rail alternatives in forecast year 2035, King County Metro and Community Transit could make additional changes in response to the project. These could include the potential for Community Transit, Sound Transit, and King County Metro to redeploy and/or reinvest in bus service that is replaced by light rail service. Such changes are dependent on transit funding and would result in a net benefit for transit riders. Also, ridership on the Sounder North commuter rail service could be affected if some riders choose to shift from commuter rail to the Lynnwood Link Extension.

7.3 Freeway Operations

As discussed in Section 7.1, the potential for increased land use development around light rail stations in the project corridor could lead to an increase in trips to and from these stations. While the potentially higher-density residential and commercial development could generate additional light rail trips, it could also increase general purpose traffic to and from these station areas. This increase in traffic could cause additional impacts on freeway mainline and ramp operations.

7.4 Arterials and Local Streets

The potential for increased land use development around light rail stations in the corridor could lead to increases in automobile and bus trips to and from these station areas. This increase in traffic could cause additional impacts on the arterials and local streets. Conversely, increased development along the light rail corridor could also result in shifts from automobile trips to other travel modes such as transit, bicycle, and pedestrian trips.

7.5 Nonmotorized Facilities

A potential increase in higher-density residential and commercial development and the associated potential for increased light rail ridership would generate additional pedestrian and bicycle trips to the stations. These trips could be added to older streets that have narrower sidewalks and lack ADA accessibility, but could also accelerate improvements to these facilities as local jurisdictions observe the increase in usage.

7.6 Parking

The potential for increased land use development around station areas in the corridor could lead to a potential increase in the demand for parking in these areas as well. This could take the form of increased demand for on-street parking for street-level retail businesses, as well as for off-street parking for both residential and commercial uses. In addition, the demand for park-and-ride spaces in areas more than 0.25 mile from the light rail stations could increase because some riders could

park along feeder bus routes and then take the bus to the light rail station. Additionally, a loss in park-and-ride demand could occur in other parallel corridors, particularly the SR 99 corridor, where park-and-ride facilities such as the Shoreline Park-and-Ride and Aurora Village Transit Center could experience lower demand as riders shift to light rail.

7.7 Safety

No indirect effects on traffic safety are anticipated as a result of the Lynnwood Link Extension.

8 CUMULATIVE IMPACTS

This chapter discusses potential cumulative transportation mobility impacts that would be caused by the Lynnwood Link Extension. The analysis of the No Build Alternative and the light rail alternatives is inherently cumulative because it is based on regional forecasts that assume future funded projects and future growth in population and employment in designated growth centers, which are consistent with adopted land use plans. However, there could be differences in effects based on the details of other individual transportation or development projects, and the actual rate and timing of population or employment growth in a given community. Key observations and findings include the following:

- Land use changes, future population and employment growth, or future transportation projects that are not assumed as part of the No Build Alternative and light rail alternatives in forecast year 2035 could potentially influence travel patterns to, from, and within the Lynnwood Link Extension corridor. These potential changes or projects could affect traffic operations on freeways, arterials, and local streets.
- Future extensions of the regional mass transit network that currently are not funded would improve transit accessibility for communities in the Lynnwood Link Extension corridor. In addition, new bus rapid transit, such as a route serving 196th Street SW, would provide increased connectivity for the Lynnwood area.
- Potential projects involving new managed or tolled lanes on I-5 or new direct access facilities to managed lanes could alter freeway and interchange operations.
- Construction of other projects could increase cumulative short-term impacts such as increased congestion, truck trips, and detours if these projects are constructed at the same time as the Lynnwood Link Extension.
- Future developments, local transportation projects, or trails improvements could add more pedestrian and bicycle trips to the street network surrounding the light rail stations.
- Future developments could generate increased parking demand within the corridor, but increases in regional transit connectivity could help offset parking demand.
- Transportation infrastructure improvements to current standards could result in improved traffic safety along roadways surrounding future light rail stations.

8.1 Regional Context and Travel Patterns

In addition to the land use changes that could occur as a result of this project (indirect and secondary impacts), additional unanticipated land use changes

throughout the region could influence the nature of travel patterns within and through the Lynnwood Link Extension corridor. For example, to the north, changes in employment levels at Boeing could cause an increase or decrease in traffic volumes and transit demand in the corridor.

Additional future transportation projects in the region that were not assumed as part of the No Build Alternative and light rail alternatives in 2035 could also potentially influence travel patterns to, from, and within the Lynnwood Link Extension corridor. As discussed in Sections 8.2 and 8.3 below, future extensions of the mass transit network and changes to the operation of I-5 would provide enhanced regional connectivity within and through the project corridor.

8.2 Transit

Future extensions of the regional mass transit network are depicted in Sound Transit's Long-Range Vision, and include an extension north from Lynnwood to Everett. If voters approve funding for construction of additional extensions, transit accessibility for the communities in the Lynnwood Link Extension corridor would be increased through connections to additional regional destinations. Moreover, Community Transit has studied the feasibility of new bus rapid transit corridors in its service area, including a potential new line serving 196th Street SW. This new transit service, which is not currently funded, would combine with the Lynnwood Link Extension to provide increased connectivity for the Lynnwood area.

8.3 Freeway Operations

In addition to the Lynnwood Link Extension, the implementation of other projects that is not reflected in this transportation analysis could affect freeway operations. The current WSDOT I-5 Express Lanes study could result in new managed or tolled lanes in the I-5 corridor, providing more efficient person throughput and reduced freeway congestion in the corridor, including at freeway interchanges near light rail stations. Other projects that could affect freeway operations include any changes to interchanges, such as the introduction of new direct access facilities to future managed lanes.

8.4 Arterials and Local Streets

The cumulative analysis of future transportation impacts in Chapter 5 was based on the results of traffic and ridership modeling that incorporated past, funded, and approved future actions, as well as projected growth that would generate development in the region.

In a separate project, Sound Transit is evaluating potential sites for a Link Operations and Maintenance Satellite Facility. One of the sites under consideration is located north of I-5 and east of 52nd Avenue West/Cedar Valley Road in Lynnwood;

however, the transportation effects of this maintenance facility would be limited. The light rail trains would enter and leave the station via a dedicated light rail guideway. While employees, service vehicles, and shipments would arrive using local streets, the traffic would not be likely to change conditions because the maintenance facility would occupy an area that is already largely developed with office and light industrial uses, and trips related to the displaced facilities would no longer occur. There would be no notable difference in the transportation effects of this maintenance facility related to any Segment C alternative—all of which have stations and park-and-ride facilities that would largely be accessed using different streets than 52nd Avenue West, which is the street access point for the facility.

The Edmonds School District owns the property being considered for this maintenance facility and they have a master plan to develop the site for a support services center. This facility will include administrative functions and an operations base with storage, maintenance, and fueling for the Edmonds' school bus fleet. If developed, the school district services center could increase traffic volumes along 52nd Avenue West, including during the morning peak period and in afternoons when the school buses are deployed. However, this added volume would not notably change the traffic impacts or mitigation measures of the Lynnwood Link Extension project, which are largely focused on access points to the Lynnwood park-and-ride and station.

Sound Transit has started construction of the Northgate Link Extension which would extend rail from the University of Washington to Northgate. While this project is scheduled to be completed and in operation prior to completion of the Lynnwood Link Extension, some construction periods will likely overlap. To address this, maintenance of traffic plans between the two projects will be coordinated. Additionally, King County is planning to construct high density transit oriented development adjacent to the planned Northgate light rail station. This development may be under construction at the same time as Lynnwood Link Extension, potentially creating additional construction related impacts to the area. Construction of this development will need to be coordinated with construction activities related to the light rail projects in order to minimize overall impacts.

Other unfunded regional and local transportation projects and development projects could result in additional effects on traffic operations and local circulation near the proposed stations. New development projects may increase vehicle trips around stations and change travel patterns on local streets, which could contribute to cumulative traffic delays on roadways within the Lynnwood Link Extension corridor. On the other hand, future transit and roadway capacity projects could improve person throughput, traffic flow, and circulation on local streets along the corridor and reduce the impacts of proposed light rail stations on local traffic operations.

Also, if the implementation of these projects overlaps, construction activities could have cumulative short-term impacts.

8.5 Nonmotorized Facilities

Future unfunded projects or accelerated growth could add more pedestrian and bicycle trips to the street network surrounding the light rail stations. These projects would also improve nonmotorized facilities associated with the project.

8.6 Parking

Similar to the previous discussion of regional travel patterns, parking within the corridor could also be affected by land use and transportation infrastructure changes that are not reflected in this analysis. In particular, transportation projects that would increase roadway throughput capacity could increase parking demand within the corridor. Conversely, increases in regional transit connectivity could decrease parking demand as travelers shift their modes of travel.

8.7 Safety

The cumulative effects of future development and transportation improvements could improve traffic safety along roadways surrounding the proposed light rail stations.

9 POTENTIAL MITIGATION MEASURES

This chapter discusses potential mitigation measures for transportation mobility impacts caused by the Lynnwood Link Extension. It also describes measures that Sound Transit proposes to take but which require agreement of other parties. For instance, Sound Transit has identified certain intersection improvements, traffic management, safety, or parking strategies to mitigate project-related impacts, but it does not have the sole authority to make those improvements when the facilities are owned and managed by others. Others may also have alternative plans or projects to address project future conditions with or without the project. In these cases, Sound Transit will coordinate with these other agencies or jurisdictions to further define and implement improvements to mitigate these project's impacts.

Key observations and findings include the following:

- **Regional Travel**—No mitigation is required to maintain regional travel.
- **Transit**—The transit integration plans developed by King County Metro and Community Transit would provide coordinated bus service with the light rail system. No additional transit mitigation is required.
- **Freeway**—No mitigation would be necessary along the I-5 mainline. However, for one alternative, A10, mitigation would be required at local intersections near the NE 145th Street proposed light rail station to prevent traffic-related effects at the I-5 southbound off-ramp.
- **Arterials and Local Street Operations**—For impacts on arterials and local streets, mitigation would be required at intersections located near proposed light rail stations that would degrade below LOS standards and/or are expected to noticeably worsen compared to the No Build Alternative. In particular, intersection and/or arterial improvements would be needed near light rail stations in Segments A and C. Sound Transit has identified potential measures to improve conditions to meet LOS standards where No Build conditions would otherwise meet standards. Sound Transit would provide these improvements or other improvements as agreed to by the local jurisdiction. In lieu of the mitigation proposed, Sound Transit could instead contribute to a local jurisdiction's project to improve intersection performance where the No Build Alternative would already be below standards, as agreed to with local jurisdictions. The intersection mitigation measures or funding contribution would likely mitigate arterial segments operating below standards for the local jurisdiction in which the impact occurs. Measures to address cut-through traffic impacts include signage, traffic calming measures, or other cut-through restrictions, and would be determined in conjunction with local jurisdictions.
- **Property Access and Circulation**—In areas where property access and local circulation would be modified by the project, Sound Transit would work with local jurisdictions to develop plans to maintain safe and effective access and

circulation. In areas near modified interchanges, FHWA and WSDOT would also be consulted.

- **Nonmotorized Facilities**—The Lynnwood Link Extension alternatives would have no impact on non-motorized facilities; therefore, no mitigation would be required.
- **Freight Mobility and Access**—The Lynnwood Link Extension would not require mitigation during operation to improve freight mobility and access because truck routes would be maintained and mobility would be maintained or improved with the project.
- **Parking**—Mitigation may be required where there are potential impacts on parking around stations. The potential exists for hide-and-ride activities near stations, and the best procedures for mitigating such activities would be specific to each station area.
- **Safety**—To address potential safety concerns related to the placement of project structures in the I-5 right-of-way, Sound Transit will coordinate with FHWA and WSDOT during final design and related design approval processes.
- **Construction**—All potential mitigation measures would comply with local regulations governing construction traffic control and construction truck routing. Sound Transit would finalize detailed construction mitigation plans in close coordination with local jurisdictions, WSDOT, King County Metro, Community Transit, and other affected agencies and organizations.

9.1 Regional Travel

Mitigation for regional travel would not be required because highways and arterials are not expected to experience adverse changes in operations. The v/c ratios and mode share would generally remain similar to the No Build Alternative or improve with the Lynnwood Link Extension.

9.2 Transit

Mitigation for transit service would not be required for the Lynnwood Link Extension because the project would improve the regional transit system and, by freeing up existing bus service resources, may allow King County Metro's and Community Transit's integration plans to provide coordinated bus service with the light rail system. To mitigate the temporary loss of park-and-ride spaces, Sound Transit would coordinate with local jurisdictions, transit providers, FHWA, and WSDOT to develop and implement plans for replacement parking and alternative access measures.

9.3 Freeway

No mitigation improvements would be necessary along the I-5 mainline. The Preferred Alternative and other light rail alternatives would have similar peak hour volumes and freeway operations along the I-5 mainline and ramps as the No Build Alternative. With the proposed mitigation measures to the arterial street system near the 145th Street interchange, described in Section 9.4 for Alternative A10, the operations of I-5 would be similar to conditions under the No Build Alternative. All other light rail alternatives would not cause impacts on the I-5 mainline or ramps.

9.4 Traffic Operations

For impacts on arterials and local streets, mitigation is potentially required at intersections where the intersection LOS with the light rail alternatives, compared with the No Build Alternative, would degrade to levels that do not meet the LOS jurisdiction standards. For locations that would operate below LOS standards with the No Build Alternative in forecast year 2035, improvements were assumed to be needed if the light rail alternatives result in substantial increases in delays compared with the No Build Alternative. Potential mitigation measures for improvements at intersections in each segment based on these criteria are described below.

These intersection improvements would improve the AM and PM peak hour intersection delay to meet LOS standards, or to achieve the same level of service or better for intersections that would be below standards with the No Build Alternative.

Sound Transit would provide these improvements or other improvements as agreed to by the local jurisdiction. In lieu of constructing the improvements proposed, Sound Transit could instead contribute to a local jurisdiction's project to improve intersection performance where the No Build Alternative would already be below standards, as agreed to with local jurisdictions.

There is some potential for increased cut-through traffic in neighborhoods to access the light rail stations via local streets. To reduce this potential impact, Sound Transit could work with local jurisdictions to consider measures such as signage, access or turn restrictions, or other traffic control measures. Final mitigation for all traffic impacts, including the potential for intersection degradation and cut-through traffic impacts, would be determined in conjunction with local jurisdictions.

Segment A Intersections

In Segment A, several intersections in Seattle and Shoreline could potentially require improvements to adjust for additional trips and changes in travel patterns to and from the proposed light rail stations. Tables 9-1 and 9-2 summarize the potential improvements Sound Transit proposes to bring intersection operations to acceptable levels. Intersection LOS results without the potential mitigation improvements are summarized in Tables 5-25 and 5-26.

Table 9-1. Forecast Year 2035 PM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment A

Nearest Station/ Intersection	LOS Standard	Alternative									Potential Improvements
		No Build	Preferred Alternative	Preferred Alternative with Options	A1	A3	A5	A7	A10	A11	
NE 145th/NE 155th Street Station											
NE 145th Street and 1st Avenue NE	E	D	D	D ^a	D ^a	D ^a	*	*	D ^a	D ^a	
NE 145th Street and 5th Avenue NE	E	D	D	D	D	D	*	*	D	D	A1, A3, A10, A11.— add a westbound right-turn lane and overlap phase
North 155th Street and Meridian Avenue North	D	D	*	*	*	*	C	C	*	*	A5, A7 - Add left-turn pockets to the northbound and southbound approaches
North 155th Street and 1st Avenue NE	D	F	*	*	*	*	C	C	*	*	A5, A7 - Add a right- turn pocket to the northbound approach
NE 155th Street and 8th Avenue NE	D	E	*	*	*	*	C	C	*	*	A5, A7 - Add a two- way left-turn lane or refuge area on NE 155th Street
NE 165th Street and 5th Avenue NE	D	F	*	*	*	*	B	B	*	*	A5, A7 - Add a second northbound through lane

Table 9-1. Forecast Year 2035 PM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment A

Nearest Station/ Intersection	LOS Standard	Alternative									Potential Improvements
		No Build	Preferred Alternative	Preferred Alternative with Options	A1	A3	A5	A7	A10	A11	
NE 185th Street Station											
North 185th Street and Meridian Avenue North	D	D	D	D	D	D	D	D	D	D	All Alternatives - Add protected-permissive phasing to the northbound and southbound left turns
NE 185th Street and 2nd Avenue NE	D	C	C	C	C	C	C	C	C	C	All Alternatives - Add a two-way left-turn lane or refuge area on NE 185th Street
NE 185th Street and 7th Avenue NE	D	D	A	A	C	C	C	C	C	C	A5, A10 —add a two- way left-turn lane or refuge area on NE 185th Street
NE 185th Street and 8th Avenue NE	D	C	C	C	C	C	D	C	D	C	A3, A7, A11—add a two-way left-turn lane or refuge area on NE 185th Street

Notes:

^a Intersection operations are improved based on mitigation at nearby or adjacent intersections. Mitigation is not proposed at this individual intersection.

* No mitigation required.

Table 9-2. Forecast Year 2035 AM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment A

Nearest Station/ Intersection	LOS Standard	Alternative									Potential Improvements
		No Build	Preferred	Preferred with Options	A1	A3	A5	A7	A10	A11	
NE 145th/NE 155th Street Station											
5th Avenue NE and I-5 Northbound Off-Ramp	D	D	D ^a	D ^a	D ^a	D ^a	*	*	D ^a	D ^a	
North 155th Street and Meridian Avenue North	D	D	*	*	*	*	C	C	*	*	A5, A7 - Add left-turn pockets to the northbound and southbound approaches
NE 185th Street Station											
North 185th Street and Meridian Avenue North	D	D	D	D	D	D	D	D	D	D	All Alternatives - Add protected-permissive phasing to the northbound and southbound left turns

^a Intersection operations are improved based on mitigation at nearby or adjacent intersections. Mitigation is not proposed at this individual intersection.

* No mitigation required.

Segment B Intersections

In Segment B, no intersections in Mountlake Terrace would require improvements to adjust for additional trips and changes in travel patterns to and from the proposed stations.

Segment C Intersections

In Segment C, four intersections in Lynnwood could potentially require improvements to adjust for additional trips and changes in travel patterns to and from the proposed light rail stations. Tables 9-3 and 9-4 summarize the potential improvements Sound Transit proposes to bring intersection operations to acceptable levels in the PM and AM peak hours, respectively. Intersection LOS results for Segment C without the potential mitigation improvements are summarized in Tables 5-29 and 5-30.

Table 9-3. Forecast Year 2035 PM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment C

Nearest Station/ Intersection	LOS Standard	Alternative						Potential Improvements
		No Build	Preferre d	Preferre d + Option	C1	C2	C3	
Lynnwood Station								
200th Street SW and 50th Avenue West	D	D	C ^a	D	C	C	C	Preferred Alternative + Options, C1, C2, C3—Add overlap phase to northbound right-turn movement
200th Street SW and 48th Avenue West	D	D	D	D	D	D	D	Preferred Alternative, Preferred Alternative + Options—Add an eastbound right turn pocket. Preferred Alternative + Options—Add a southbound right- turn pocket
52nd Avenue West and 204th Street SW	E	E	A	A	A	A	A	All Alternatives - Change traffic control from two-way stop control to signal or roundabout

^a Intersection operations are improved based on mitigation at nearby or adjacent intersections. Mitigation is not proposed at this individual intersection.

Table 9-4. Forecast Year 2035 AM Peak Hour Intersection LOS with Potential Mitigation Improvements—Segment C

Nearest Station / Intersection	LOS Standard	Alternative						Potential Improvements
		No Build	Preferred	Preferred with Option	C1	C2	C3	
Lynnwood Station								
200th Street SW and 44th Avenue West	E	E	E	D	D	D	D	Preferred Alternative + Options, C1, C2, C3 – Add a second northbound left-turn lane and extend the eastbound right-turn pocket back to the P&R driveway
200th Street SW and 50th Avenue West	D	C	C ^a	C	C	C	C	Preferred Alternative + Options, C1, C2, C3—Add overlap phase to northbound right-turn movement
200th Street SW and 48th Avenue West	D	C	D	D	D	D	D	Preferred Alternative, Preferred Alternative + Options – Add an eastbound right-turn pocket. Preferred Alternative + Options – Add a southbound right-turn pocket

^a Intersection operations are improved based on mitigation at nearby or adjacent intersections. Mitigation is not proposed at this individual intersections.

9.5 Property Access and Local Circulation

In areas where property access and local circulation would be modified by the project, Sound Transit would work with local jurisdictions to develop and implement plans to maintain safe and effective access and circulation. In areas near modified interchanges, FHWA and WSDOT would also be involved.

To discourage cut-through traffic that may occur on residential streets in station areas, Sound Transit would work with local jurisdictions to define and implement appropriate neighborhood traffic controls.

9.6 Nonmotorized Facilities

The Lynnwood Link Extension alternatives would have no impact on non-motorized facilities; therefore, no mitigation would be required.

9.7 Freight Mobility and Access

The Lynnwood Link Extension would not require mitigation during operation to improve freight mobility and access because truck routes would be maintained and mobility would be maintained or improved with the project.

9.8 Parking

Where the project would remove off-street private parking spaces, Sound Transit would work with property owners to provide compensation or replacement parking.

To discourage transit patrons from parking outside of designated park-and-ride facilities, Sound Transit would work with local jurisdictions to evaluate and, if necessary, implement hide-and-ride mitigation. With this approach, Sound Transit would inventory on-street parking around each station before and after the start of light rail revenue service, and would then work with the local jurisdictions to determine where mitigation measures would be needed. Potential parking control measures include parking meters, restricted parking signage, passenger and truck load zones, and residential parking zone programs.

Sound Transit would be responsible for the cost of installing signage or other parking controls for 1 year after the light rail extension begins operation. The local jurisdictions would be responsible for monitoring, enforcing and maintaining the parking controls.

9.9 Safety

To address potential safety concerns related to the placement of project structures in the I-5 right-of-way, Sound Transit will coordinate with FHWA and WSDOT during final design and would secure highway-related design approvals before construction.

9.10 Construction

9.10.1 Transit

Construction would affect the existing 5th Avenue NE/NE 133rd, North Jackson Park, Mountlake Terrace Transit Center, and Lynnwood Transit Center Park-and-Ride lots. Mitigation measures would include the following, as appropriate, or other measures developed in coordination with transit agencies:

- Service increases or other measures to encourage transit trips that do not require automobile access.
- Redirect transit riders who use these locations to nearby park-and-ride lots.
- Develop temporary parking for transit riders to use during construction.
- Use construction phasing strategies to build new park-and-ride spaces and temporary parking spaces before the loss of existing spaces.
- Lease parking lots and/or new parking areas near the closed park-and-ride lots.

During construction, transit service mitigation measures for partial closures of the Mountlake Terrace Transit Center and Lynnwood Transit Center. Transit service mitigation would include the following, as appropriate, or other measures developed in coordination with transit agencies and local jurisdictions:

- Relocate transit stops to adjacent streets.
- Provide a temporary transit center at a nearby off-street location.
- Revise transit services (including temporary service between Mountlake Terrace and destinations in King County due to temporary closure of the Mountlake Terrace Freeway station).

Transit service mitigation measures for partial or full closures would include rerouting of buses, where appropriate, to maintain transit service. Sound Transit would coordinate with King County Metro, Community Transit, and private transit service providers to minimize construction impacts and disruptions to bus facilities and services. Sound Transit will coordinate with these providers to inform passengers about changes with measures such as signage at existing transit stops and using website information, rider information systems, emails, and agency mailing lists.

9.10.2 Freeway Operations and Safety

As part of the WSDOT and FHWA approval process for construction within I-5 right-of-way and to minimize safety and operational impacts during construction, Sound Transit would collaborate with WSDOT and FHWA to develop and implement the project's Maintenance of Traffic plan. Sound Transit would coordinate construction with incident management, construction staging, and traffic control in places where the light rail construction would affect freeway traffic or involve changes to the roadside environment. Sound Transit would also coordinate with WSDOT to disseminate construction closure information to the public as needed.

9.10.3 Arterials and Local Streets

The adverse transportation impacts that would occur during construction include temporary lane or roadway closures during peak hours, temporary increases in truck traffic, and temporary loss of parking in some construction staging areas. Sound Transit would develop and implement detailed construction mitigation plans in close coordination with local jurisdictions and WSDOT during the final design and permitting phases of the project. Sound Transit would:

- Develop the Maintenance of Traffic plan to conform to the *Manual on Uniform Traffic Control Devices* and jurisdictional agency requirements for all traffic control.
- Use lighted or reflective signage to direct drivers to truck haul routes to ensure visibility during nighttime work hours.
- Use temporary reflective truck prohibition signs on streets with a high likelihood of cut-through truck traffic.
- Communicate public information about construction activities through tools such as print, radio, posted signs, Web sites, email and direct communication with other agencies and affected parties; ongoing communications would update interested parties regarding street or freeway lane closures, detours, hours of construction, business access, and parking impacts.
- Coordinate access closures with affected businesses and residents. The contractor will be required to perform this task in coordination with Sound Transit staff. If access closures are required, property access to residences and businesses would be maintained to the extent possible. If access to the property cannot be maintained, the specific construction activity would be reviewed to determine if it could occur during non-business hours, or if the parking spaces and users of this access (for example, deliveries) could be provided at an alternative location.
- Require the contractor to provide parking areas for construction workers, where necessary, which could be the responsibility of the contractor. This may include providing remote parking with shuttle service to and from the construction site if sufficient on-site parking cannot be provided.
- Post advance notice signs prior to construction in areas where surface construction activities would affect access to surrounding businesses.
- Schedule traffic lane closures and high volumes of construction truck traffic during off-peak hours to minimize delays during periods of higher traffic volumes as much as possible.
- Evaluate and limit concurrent construction to minimize construction impacts in developing the Maintenance of Traffic plan.
- Cover potholes and open trenches, where possible, and use protective barriers to protect drivers from trenches remaining open.

- Provide temporary parking to mitigate loss due to construction staging or work activities, as appropriate.

9.10.4 Parking

In locations where Sound Transit would remove off-street private parking spaces, Sound Transit would work with property owners to provide compensation or replacement parking.

9.10.5 Nonmotorized Facilities

Sound Transit would minimize potential impacts on pedestrian and bicycle facilities by providing detour routes within and through construction areas. Sound Transit would also notify the public of these changes. Multi-use trails that might be affected by construction would generally be kept open. Detours would be provided when trails are closed, unless they are closed for short durations or in areas where a detour option is not feasible. Closures or restrictions to I-5 crossings would be sequenced to maintain travel across I-5 at the next nearest crossing.

9.10.6 Freight Mobility and Access

To minimize impacts due to delays and restricted access for business deliveries on arterials and local streets, Sound Transit would work with local jurisdictions to develop and implement construction traffic control plans. The agency also would coordinate with affected businesses before and during the construction period to maintain business access as much as possible.

For construction associated with I-5, Sound Transit would coordinate with freight stakeholder groups by providing construction information to WSDOT for use in the state's freight notification system. Sound Transit would provide information in a format acceptable to WSDOT.

9.10.7 Cumulative Construction Impacts

To mitigate cumulative impacts of potentially overlapping construction periods in the Northgate area, Sound Transit would coordinate the construction activities of the Northgate Link Extension and Lynnwood Link Extension projects, and would also coordinate with the King County Metro transit-oriented development project.

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APPENDIX A

Transportation Technical Analysis Methodology

Introduction

This technical analysis methodology memorandum describes the methods that will be used to analyze the impacts on transportation for the Lynnwood Link Extension Project Environmental Impact Statement (EIS). The transportation section of the EIS identifies and evaluates the short- and long-term impacts of project alternatives on the following:

- Regional transit system, including ridership and mode share;
- Regional traffic, including vehicle miles of travel, vehicle hours of travel, and vehicle hours of delay;
- Project corridor traffic;
- Road-based transit service;
- Intersection level of service;
- Freeway level of service;
- Property access and local traffic circulation;
- Parking near stations and at park-and-ride lots;
- Bicycle and pedestrian circulation;
- Freight movement within the corridor including trucking and freight rail;
- Construction impacts; and
- Safety.

In addition to the impacts analysis related to the topics listed above, the memorandum also describes the transportation analysis that will be conducted to:

- Describe cumulative transportation effects; and
- Develop data for use by other disciplines, including air quality, noise, energy, and environmental justice.

These methods are being provided for review and comment by participating and cooperating agencies for the Lynnwood Link Extension Project EIS. The review of methods at the start of the EIS process is consistent with the National Environmental Policy Act (NEPA) environmental review procedures established by Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), codified as 23 United States Code (USC) §139. Sound Transit and the Federal Transit Administration (FTA) initiated the EIS process for the project in September 2011, and they invited potential cooperating and participating agencies to take part in the EIS process.

Lynnwood Link Extension Project Area

The proposed Lynnwood Link Extension Project would begin at Northgate in north Seattle and end at the Lynnwood Transit Center, and would be about 8.5 miles long, as shown in Figure A-1. The transportation corridor it serves is bounded by Puget Sound to the west and Lake Washington to the east, and is within the cities of Seattle and Shoreline in King County, and Mountlake Terrace and Lynnwood in Snohomish County. The corridor generally follows Interstate 5 (I-5), the major north-south route through Washington, and serves a large commuter market that travels toward Seattle or north to Everett, where many of the region's jobs are located.

The Lynnwood Link Extension project alternatives would extend light rail from the planned north terminus of the North Link light rail system at Northgate, and extend north along I-5 to Lynnwood. A separate preface for this methodology memorandum describes the range of alternatives being analyzed in the EIS.

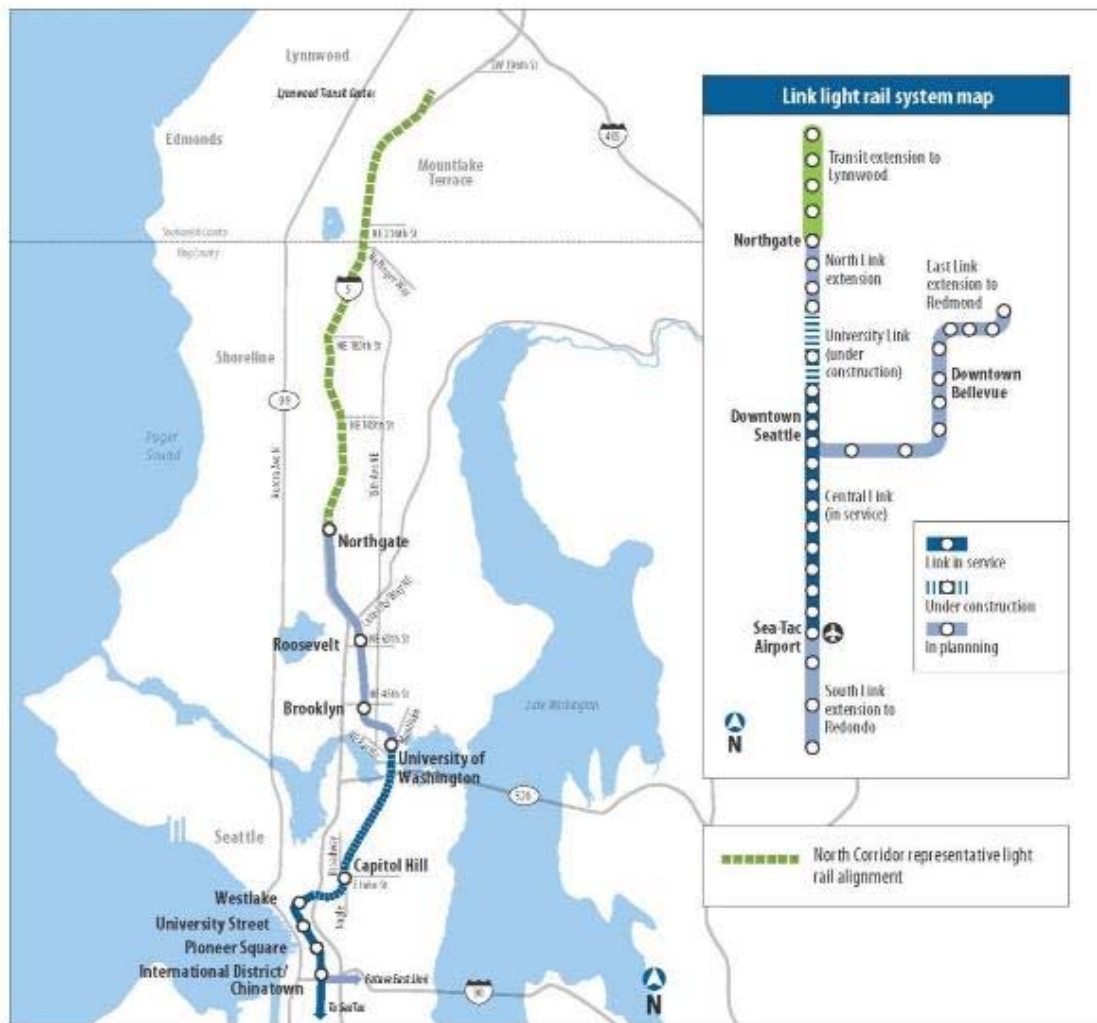


Figure A-1. Study Area for Transportation Analysis

Guiding Regulations, Plans, and/or Policies

The transportation analysis will be guided by the following laws and regulations:

- NEPA
- State Environmental Policy Act (SEPA)
- SAFETEA-LU, Public Law 109-59
- Code of Federal Regulations (CFR) 23 Part 450 (implementing USC 23 Section 111, which requires the U.S. Secretary of Transportation to approve access revisions to the Interstate System)
- CFR 23 Part 771 (Environmental Impact and Related Procedures)
- Washington State Growth Management Act (Revised Code of Washington [RCW] 36,70A.070)

In addition to the laws and regulations identified above, analysis of local transportation impacts will be guided by the policy direction established in the numerous plans or policy documents adopted within the project corridor. These include, but are not limited to:

- Sound Transit 2 (ST2), approved November 4, 2008
- Strategic Plan for Public Transportation 2011–2021 (King County Department of Transportation Metro Transit Division, 2011)
- 2012–2017 Transit Development Plan (Community Transit, November 15, 2011 Draft)
- Community Transit Long-Range Transit Plan (Community Transit, February 4, 2011)
- Washington Transportation Plan 2007–2026 (Washington State Department of Transportation [WSDOT], November 14, 2006)
- WSDOT Design Manual
- WSDOT Development Service Manual (M.3007.00)
- Puget Sound Regional Council (PSRC) Transportation 2040: Toward a Sustainable Transportation System
- Comprehensive and/or Transportation Plans for the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood, as well as King County and Snohomish County
- 6-Year Capital Improvement Program for the Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood, as well as King County and Snohomish County

Agency Coordination

The transportation planning and analysis process will involve local jurisdictions, state agencies, federal agencies, transit agencies, PSRC, and other interested parties.

NEPA Lead Agency

FTA will be the lead agency for development of the EIS in accordance with NEPA regulations.

Cooperating and Participating Agencies

For the development of the transportation technical report, Sound Transit staff and consultants will meet with and/or provide opportunity for coordination with staff planners and engineers from the cooperating and participating agencies for this project:

- WSDOT
- Federal Highway Administration (FHWA)
- PSRC
- Community Transit
- King County
- City of Lynnwood
- City of Mountlake Terrace
- City of Shoreline
- City of Seattle
- Snohomish County
- King County

Data Needs and Sources

A variety of data will be collected and assembled to analyze the transportation-related effects of project alternatives. These data sets will include the following:

- Existing peak-hour turning-movement counts at the intersections identified below under “Intersections to be Studied.” These counts will be collected from the local and state agencies (Cities of Seattle, Shoreline, Mountlake Terrace, and Lynnwood; and WSDOT) for the PM peak hour for all locations, and for the AM peak hour for selected locations where AM peak hour operations is determined to be as, or more critical, than PM peak hour operations. For I-5, volume data from WSDOT’s loop counters will be used to generate existing mainline and ramp volumes. New counts will be taken for a 2-hour period during the PM peak hour, if year 2010 or more recent turning-movement counts are not available from the agencies listed above.

The new counts will include automobiles; trucks classified by light, medium, and heavy types; buses; pedestrians; and bicyclists. AM peak hour turning-movement counts will also be collected where AM peak hour volumes are the highest or the existing/future traffic issues are considered critical during the AM time period (i.e., if an intersection provides access to a regional facility). These locations will be chosen based on area knowledge, a comparison of available AM versus PM peak hour traffic volumes, and/or if identified by Sound Transit, and local or state agency staff. All peak-hour turning-movement counts will be factored to a common base analysis year (2012) based on available historical data trends.

- Daily traffic counts in the study area, as available from local jurisdictions. These counts will be factored to a common base analysis year (2012).
- Physical characteristics of the existing street system, including functional use, lane geometry, traffic signal timing and phasing patterns, and other parameters necessary to conduct traffic operations analysis (such as the proximity of bus stops, speed limits, presence of on-street parking, etc.). Where available, these data will be obtained from local agencies (such as paint line sketches developed by the City of Seattle) and will be field checked as appropriate.
- On- and off-street parking supply and peak weekday parking utilization survey data will be collected within a 0.25-mile walking distance of each station and for all at-grade or elevated alignments that are within the road right-of-way. Data will be obtained from the Cities of Lynnwood, Mountlake Terrace, Shoreline, and Seattle, and augmented by field visits where appropriate.
- Park-and-ride supply and demand data will be collected at either proposed stations or locations within a 0.25-mile walking distance of each station. Existing park-and-ride information and utilization rates will be collected from King County Metro, Community Transit, and WSDOT, where available, and supplemented by field visits as appropriate.
- Pedestrian volumes will be collected in areas with high pedestrian activity (including station areas, activity centers, and major nonmotorized facilities), and where existing counts have been conducted by local jurisdictions. The data collection effort will be limited to the intersections identified below under “Intersections to be Studied.” Pedestrian and bicycle volume data will also be collected for major nonmotorized facilities near proposed station areas.
- Existing and planned pedestrian and bicycle facilities within an approximate 0.50-mile of each station area (1.0 mile for bicycle facilities) will be inventoried by either field visits or available information from agencies (such as geographic information system [GIS] data). This inventory will include identification of school walk routes and any barriers to pedestrian or bicycle travel within each station area. The general sidewalk condition immediately surrounding station areas will be qualitatively assessed.

- Existing transit route information along the proposed build alternatives will be obtained from local transit agencies and compiled. This task will include information on selected routes that serve the project corridor. The bus route information will include service areas, hours of service (including schedule/frequency), reliability, and passenger load. Passenger load information will be collected at selected screenline locations. Transit reliability information will be collected for selected routes that serve the project corridor.
- Accident data for the most recent 3-year period will be obtained for the study area intersections (signalized and unsignalized) and on I-5 between the 44th Avenue West and NE Northgate Way interchanges. Accident data for roadway segments (between intersections) will be collected only where at-grade or elevated light rail alternatives are running within or immediately adjacent to a roadway. Existing truck corridors/routes and any truck weight or height restrictions will be identified; truck volume data for the I-5 corridor also will be collected.
- Local, regional, and state agency Six-Year Transportation Improvement Plans/Capital Improvement Programs or Transportation Facilities Plans, as well as other planned improvements in proximity to a light rail alignment or station area will be reviewed and summarized. This effort will include identification of all “committed” improvements assumed for the No Build Alternative.

Study Area and Area of Effect

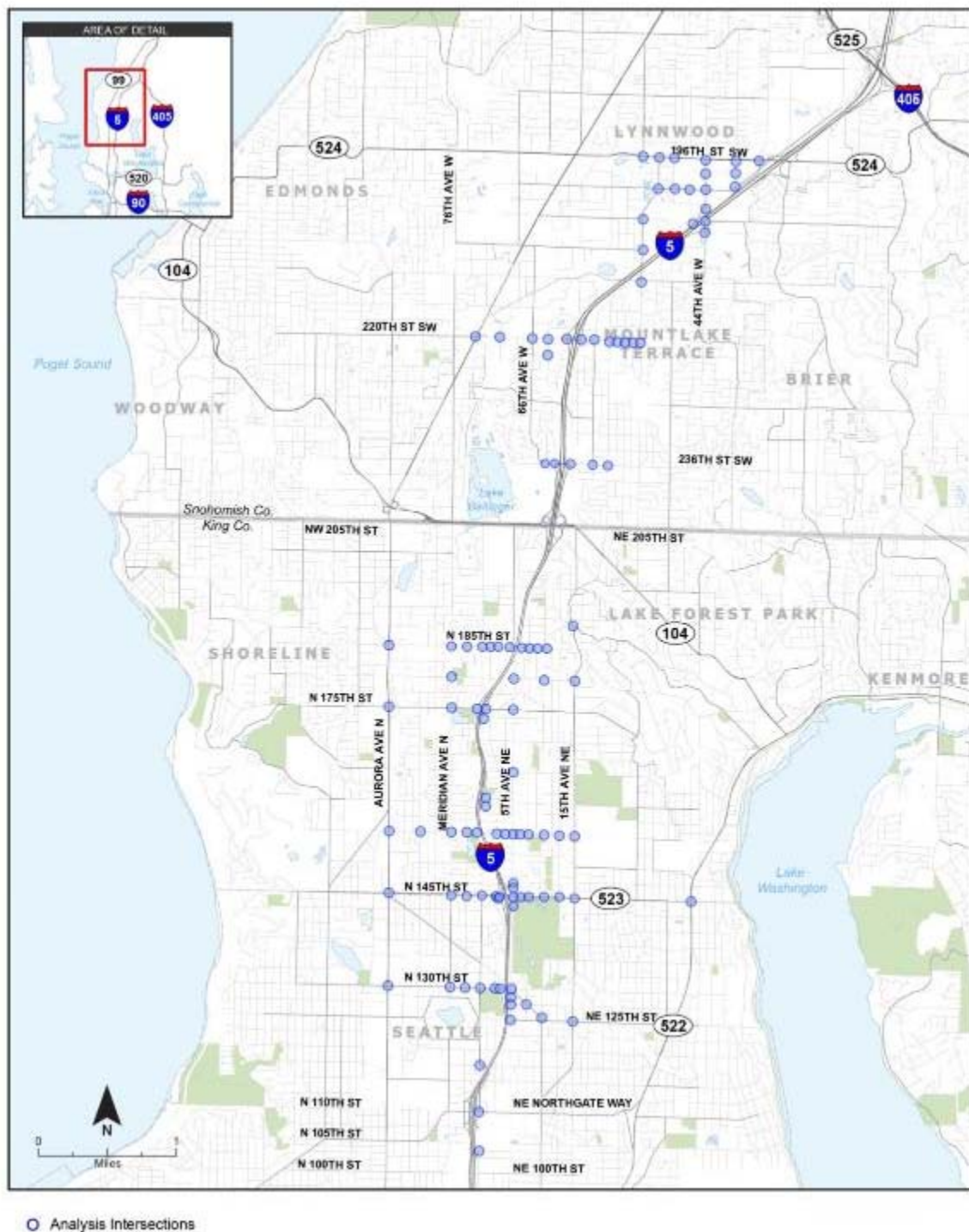
Geographic Coverage

The transportation analysis will include evaluation measures that consider systemwide as well as more localized impacts. Analysis of systemwide traffic impacts will address the effects of project alternatives on travel movements within the light rail corridor study area. Figure A-1 shows the study area within the context of the Puget Sound region. The arterial and local street analysis will focus on locations assumed to be most likely affected by the light rail alternatives. The intersections that will be analyzed are those directly affected, such as by a change in channelization or signal control, as well as those indirectly affected by changes in volume due to trips accessing the system. These latter locations will include intersections surrounding transit stations with proposed increases in park-and-ride lot capacity and passenger pick-up and drop-off activity.

Intersections to be Studied

A preliminary list of intersection locations has been identified for analysis based on the components of the I-5 alignment alternative identified in the Phase 1 Alternatives Analysis. This list, provided below by jurisdiction and station area, will be reviewed and modified as necessary with Sound Transit and local jurisdiction staff, as appropriate, to reflect the final selection of alternatives to be evaluated in the EIS.

Final confirmation of intersections to be studied will be documented in a separate memorandum. Figure A-2 shows the locations of these intersections.



Source: North Corridor transit Project Transportation Analysis Methodology Report

Figure A-2. Analysis Intersections

City of Lynnwood (20 intersections)

Lynnwood Transit Center Station

- 200th Street SW/50th Avenue West
- 200th Street SW/48th Avenue West
- 200th Street SW/46th Avenue West
- 200th Street SW/44th Avenue West
- 204th Street SW/52nd Avenue West
- 208th Street SW/52nd Avenue West
- 212th Street SW/52nd Avenue SW
- I-5 Direct Access/46th Avenue NE on and off HOV ramp
- I-5 Southbound on-ramp/44th Avenue West
- 204th Street SW/44th Avenue West
- I-5 Northbound off-ramp/44th Avenue West
- Alderwood Mall Boulevard/40th Avenue West
- 196th Street SW/52nd Avenue West
- 196th Street SW/50th Avenue West
- 196th Street SW/48th Avenue West
- 196th Street SW/44th Avenue West
- 196th Street SW/40th Avenue West
- 196th Street SW/36th Avenue West
- 198th Street SW/44th Avenue West (future analysis only)
- 198th Street SW/40th Avenue West (future analysis only)

City of Mountlake Terrace (18 intersections)

220th Street Station SW

- 222nd Street SW/64th Avenue West
- 220th Street SW/State Route (SR) 99
- 220th Street SW/70th Avenue West
- 220th Street SW/66th Avenue West
- 220th Street SW /64th Avenue West
- 220th Street SW/I-5 southbound ramps
- 220th Street SW/I-5 northbound ramps
- 220th Street SW/58th Avenue West
- 220th Street SW/56th Avenue West
- 220th Street SW/55th Avenue West

- 220th Street SW/54th Avenue West
- 220th Street SW/53rd Avenue West
- 220th Street SW/52nd Avenue West

Mountlake Terrace Station

- 236th Street SW (Lakeview Drive)/64th Avenue West
- 236th Street SW (Lakeview Drive)/I-5 southbound on-ramp
- 236th Street SW/I-5 northbound off-ramp/Mountlake Terrace Park-and-Ride driveway
- 236th Street SW/58th Avenue West
- 236th Street SW/56th Avenue West

City of Shoreline (38 intersections)***NE 185th Street Station***

- North 185th Street/Aurora Avenue North
- NE 185th Street/Meridian Avenue North
- NE 185th Street/Corliss Avenue North
- NE 185th Street/1st Avenue NE
- NE 185th Street/2nd Avenue NE
- NE 185th Street/3rd Avenue NE
- NE 185th Street/5th Avenue NE
- NE 185th Street/7th Avenue NE
- NE 185th Street/8th Avenue NE
- NE 185th Street/9th Avenue NE
- NE 185th Street/10th Avenue NE
- NE Perkins Way/15th Avenue NE
- North 180th Street/Meridian Avenue North
- NE 180th Street/5th Avenue NE
- NE 180th Street/10th Avenue NE
- NE 180th Street/15th Avenue NE
- North 175th Street/Aurora Avenue North
- North 175th Street/Meridian Avenue North
- NE 175th Street/southbound I-5 ramps
- NE 175th Street/northbound I-5 ramps
- NE 175th Street/5th Avenue NE
- NE 174th St/1st Avenue NE

NE 155th Street Station

- North 155th Street/Aurora Avenue North
- North 155th Street/Ashworth Avenue North
- North 155th Street/Meridian Avenue North
- North 155th Street/Corliss Avenue North
- NE 155th Street/1st Avenue NE
- NE 155th Street/3rd Avenue NE
- NE 155th Street/4th Avenue NE
- NE 155th Street/5th Avenue NE
- NE 155th Street/6th Avenue NE
- NE 155th Street/8th Avenue NE
- NE 155th Street/10th Avenue NE
- NE 155th Street/12th Avenue NE
- NE 155th Street/15th Avenue NE
- NE 161st Avenue/1st Avenue NE
- NE 165th Street and 5th Avenue NE
- NE 159th Avenue NE/1st Avenue NE

The following intersections, counted under the City of Seattle, will be evaluated for both the NE 155th Street Station and NE 145th Street Station:

- North 145th Street (SR 523)/Meridian Avenue North
- NE 145th Street (SR 523)/1st Avenue NE
- NE 145th Street (SR 523)/5th Avenue NE
- NE 145th Street (SR 523)/15th Avenue NE

City of Seattle (33 intersections)

NE 145th Street Station

- North 145th Street (SR 523)/Aurora Avenue North
- NE 145th Street (SR 523)/Meridian Avenue North
- NE 145th Street (SR 523)/Corliss Avenue North
- NE 145th Street (SR 523)/1st Avenue NE
- NE 145th Street (SR 523)/3rd Avenue NE
- NE 145th Street (SR 523)/4th Avenue NE
- NE 145th Street (SR 523)/I-5 Southbound Ramps
- NE 145th Street (SR 523)/5th Avenue NE
- 5th Avenue NE/I-5 northbound off-ramp

- 5th Avenue NE/I-5 northbound transit only off-ramp/I-5 northbound on-ramp
- 5th Avenue NE/North Jackson Park-and-Ride driveway
- NE 145th Street (SR 523)/6th Avenue NE
- NE 145th Street (SR 523)/8th Avenue NE
- NE 145th Street (SR 523)/10th Avenue NE
- NE 145th Street (SR 523)/12th Avenue NE
- NE 145th Street (SR 523)/15th Avenue NE
- NE 145th Street (SR 523)/Bothell Way NE

NE 130th Street Station

- NE 130th Street/Aurora Avenue North
- NE 130th Street/Meridian Avenue North
- NE 130th Street/Corliss Avenue North
- NE 130th Street/1st Avenue NE
- NE 130th Street/3rd Avenue NE
- NE 130th Street/I-5 southbound on-ramp
- NE 130th Street/5th Avenue NE/Roosevelt Way NE
- 5th Avenue NE/I-5 northbound off-ramp
- 5th Avenue NE/NE 127th Street
- 5th Avenue NE/NE 125th Street
- Roosevelt Way NE/10th Avenue NE
- NE 127th Street/8th Avenue NE/Roosevelt Way NE
- NE 125th Street/15th Avenue NE

Northgate Station Area

- North Northgate Way/1st Avenue NE
- 1st Avenue NE/I-5 Express on- and off-ramps
- 1st Avenue NE/North 117th Street

Approach for Finalizing List of Intersections to be Studied

The existing conditions at all study area intersections identified above will be evaluated using traffic data collected at the outset of the project. Additionally, the design year 2035 PM peak hour analysis for the No Build Alternative will be developed for the same study area intersections. For the light rail alternatives, a screening process will be applied to each of the study area intersections, using threshold values, to pinpoint conditions that could result in a change in the level of service (LOS) at the intersection. Additional intersections or revision of the study area will be reviewed once design year 2035 forecasts have been developed. At that

time, it will be determined where changes in vehicle and/or pedestrian/bicycle volume demand and patterns occur within the build alternative to warrant a change in the study area limits. No further analysis beyond the no-build conditions will be conducted at study area intersections where changes in traffic volumes or other conditions in the build alternatives are expected to be below the threshold values identified in Table A-1.

The methodology is to conduct the light rail alternatives intersection analysis for only the worst-case traffic impact condition. Any light rail alignment that has direct (physical) geometry impacts on an intersection will also be analyzed.

Table A-1. Intersection Analysis Screening Process

Parameter	Threshold Value	Description
Critical Volumes	5%	Forecasts indicate that a critical volume comparison between a light rail alternative and the No Build Alternative would exceed the threshold value.
Change in Intersection Geometry	Changes in the number of lanes in any approach	Changes in intersection geometry resulting in the addition or deletion of a lane in any approach would change the capacity of the intersection and could affect LOS.
Change in Intersection Control	Traffic signal installation	The addition of a traffic control device such as a signal would affect the capacity for some traffic movements, and could change the overall LOS.
Crosswalk Lengths Across Major Streets	Increased crossing distance	Green traffic signal time for side streets would be extended and pedestrian clearances would be longer.
Intersection LOS	If the intersection operates with a delay value within 10% of the agency's LOS threshold	Locations meeting the threshold criterion with the No Build Alternative would likely require further analysis. For example, if an intersection operates at LOS E (75 seconds) in No Build and the LOS threshold is LOS E (80 seconds), the intersection is then included in the light rail analysis.

Individual Roadway Segments to be Studied

For the EIS, segments of I-5 between the 196th Street SW ramps in Lynnwood and the vicinity of NE Northgate Way in Seattle may be analyzed if the geometry of the mainline or interchanges in the segment have changed due to the project, or if the project is estimated to add substantial traffic volumes to the mainline and/or interchanges. For any locations determined to be affected, the analysis will include the I-5 mainline and merge/diverge areas adjacent to the affected interchanges. Potential locations of analysis could include segments upstream and downstream of the following interchanges:

- 196th Street SW (Exit 181B)
- SR 524 Cedar Way Spur/44th Avenue West (Exit 181A)
- 220th Street SW (Exit 179)
- 236th Street SW (Exit 178)

- SR 104/NE 205th Street (Exit 177)
- NE 175th Street (Exit 176)
- Metro North Operating Base (Exit 175B)
- SR 523/NE 145th Street (Exit 175)
- NE 130th Street/Roosevelt Way NE (Exit 174)
- NE Northgate Way (Exit 173)

In Shoreline, the following arterials will be evaluated for volume-to-capacity (v/c) ratios to ensure consistency with city concurrency standards. The following arterial segments have been identified for v/c analysis:

- NE 155th Street—Aurora Avenue N to 15th Avenue NE
- NE 185th Street—Aurora Avenue N to 10th Avenue NE
- 5th Avenue NE/7th Avenue NE—NE 145th Street to NE 185th Street
- Meridian Avenue North—North 145th Street to North 185th Street
- 15th Avenue NE—NE 145th Street to NE 185th Street
- NE 175th Street—Aurora Avenue North to 5th Avenue NE

Affected Environment

The affected environment for transportation includes all components of the transportation system within the affected area. These components include traffic-related operations and performance on all roadway facilities; transit, both road-based and rail; freight; bicycles; and pedestrians. The anticipated effect on parking facilities will also be assessed. Particular focus for these modes will be on transportation facilities in the vicinity of proposed transit stations and park-and-ride lots because these will be the primary site-specific traffic attractors and generators. However, effects on the regional transportation system will also be considered. Measures for assessing impacts on these transportation elements, discussed in the following sections, will be both quantitative and qualitative and will be displayed both graphically and in a tabular format as appropriate. Primary issues of concern include impacts on overall mobility for these various modes (e.g., travel times, speeds, and accessibility) as well as reliability and safety. These issues need to be assessed for the construction stages of the proposed project as well as for when the project is fully operational.

Environmental Impacts Analysis

This section discusses the potential impacts of the No Build Alternative and the light rail alternatives (including all alignment options and station locations). It also describes the methodology used to determine direct and indirect (long term/operational and construction) as well as cumulative impacts on transportation.

Direct Impacts

Transportation Analysis Years

Based on the project's schedule and available traffic forecasting data, the transportation analysis will focus on three distinct periods:

- Existing Year—2012.
- Design Year—2035. This is the proposed design analysis year. This design year needs to be confirmed based on further coordination with local agencies, FTA, WSDOT, FHWA, and others.
- Construction Period. If construction impacts are determined to need more than a qualitative assessment for any particular location, the existing year 2012 volumes will be used for assessing construction impacts on transportation, or extrapolated to the year of construction.

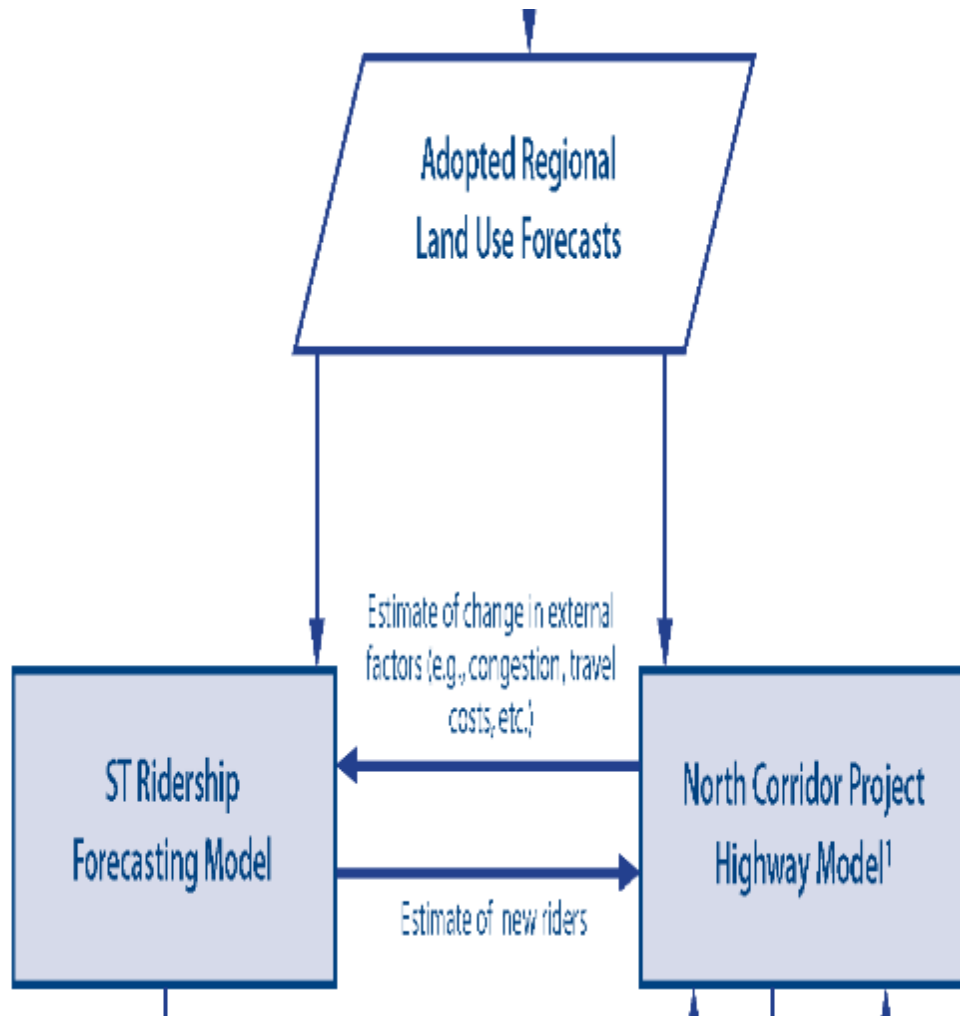
Analysis Tools

This section describes the tools that will be used to conduct the transportation analysis for the EIS.

Travel Demand Forecasting

The transportation team will use two regional travel demand models to support assessment of future conditions, including development of transit ridership forecasts and future roadway traffic volumes. The Sound Transit Ridership Model will be used to produce ridership forecasts, while the PSRC Regional Model: WSDOT Project Version will be used to calculate growth in vehicular traffic volumes to support traffic operations analysis, as well as data required for a variety of environmental analyses.

Figure A-3 illustrates the relationship between the demand models.



¹ The NCTP Highway Model is based on the version of the PSRC regional model used for major WSDOT project (e.g., SR 520 FEIS), with additional network refinements.

Source: North Corridor transit Project Transportation Analysis Methodology Report

Figure A-3. Ridership and Highway Demand Models Relationship

Sound Transit Ridership Model

The current version of the Sound Transit Ridership Model was developed using analytical ridership forecasting procedures developed over two decades of incremental methods applications. During this period, the methods have been subjected to substantial external review, including two independent Expert Review Panels, and two cycles of review by the FTA over the course of New Starts grant applications for Link light rail projects. For more detailed information about the Sound Transit Ridership Model, see the *North Corridor Transit Project Transit Ridership Forecasting Technical Report* (December 2010).

One of the key tasks for the transportation team will be to update the Sound Transit model, in conjunction with Sound Transit and FTA, to reflect the latest information available. The updated model will be 2011-based, using new surveys and counts data

within the general incremental modeling framework. The updated Sound Transit model will be used to produce ridership forecasts for use in the EIS and in support of the New Starts application of the Lynnwood Link Extension project to FTA for entry into Preliminary Engineering.

PSRC Regional Model

The PSRC Regional Model: WSDOT Project Version was developed for the SR 520 EIS, I-405 expansion, and WSDOT Express Lanes Pre-Design Studies (including I-5 HOT-lane assessment). As part of this task, the PSRC model will be refined to reflect necessary network modification specific to the project corridor, as well as the latest PSRC land use forecasts. Transit ridership forecast results from the Sound Transit Ridership Model are incorporated into the PSRC model to reflect effects from changes in transit ridership on traffic levels at the screenline and/or regional systemwide level. Traffic forecast results from the PSRC model form the basis upon which traffic impacts of the project are assessed. Growth rates derived from the PSRC model output will be applied to observed traffic volume counts to develop estimated peak-hour and daily traffic forecasts for detailed traffic operations analysis. The model will also be used to provide required input for other environmental disciplines including air quality modeling, noise analysis, greenhouse gas assessment, environmental justice analysis, and community equity evaluation.

Traffic Operations Analysis

VISSIM

The transportation team will assess freeway traffic operations at specific locations where the build alternative(s) are expected to affect freeway operations. An analysis would be conducted using a traffic simulation model developed in the VISSIM modeling environment (version 5.0 or later). The VISSIM model can include mainline freeway segments, ramps, and ramp terminal intersections, as well as selected adjacent arterial intersections and street segments where appropriate. The model replicates traffic flow by simulating discrete vehicle movements to produce estimates of travel speeds and traffic density, which can be used to assess highway LOS consistent with the *Highway Capacity Manual* (HCM) definitions.

Synchro/SimTraffic

The transportation team will assess intersection traffic operations for key locations on the arterial network using models developed with Trafficware Corporation's Synchro software (version 7.0 or later). Synchro is a traffic modeling program designed for analysis of intersection traffic operations and the optimization of traffic signal timings. Synchro reports average vehicle delay, allowing calculation of LOS

consistent with HCM definitions. Synchro also estimates average and maximum queue lengths.

Other Tools

Other tools that may be used include Highway Capacity Software (HCS), which may also be used as necessary to estimate LOS impacts for both arterial and freeway traffic operations at isolated locations where use of Synchro or Vissim is not warranted, generalized LOS calculations based on v/c ratios by facility and/or screenline, and a spreadsheet-based sketch-planning method¹⁷ for estimating park-and-ride lot demand to supplement forecasts from the Sound Transit Ridership Model. Additionally, mode of access tools including GIS-based determination of 15-minute walk, bicycle, and automobile “access sheds” will be used to refine the mode of access estimates.

Assessment Methods and Analysis Thresholds

Transportation System

Regional Transit

Evaluation Criteria

The following evaluation criteria will be considered for assessing effects of the project on regional transit for the proposed design year of 2035:

- Project corridor ridership—Daily boardings (inbound boardings and outbound alightings) by alternative and study year will be produced for the project, defined as Lynnwood to Northgate. For the No Build Alternative, corridor daily bus ridership will be estimated for the bus routes that are assumed to be truncated and/or otherwise replaced by the light rail alternative(s).
- Mode share—Change in systemwide mode split between transit and automobile by alternative and study year.
- Transit quality of service—This will be measured by assessing changes in transit service frequency, hours of service, passenger load, and effects on transfers. The analysis will reflect anticipated changes in bus service by King County Metro, Community Transit, and Sound Transit.
- Transit user benefit—This will be measured in annual minutes of weighted transit travel time saved, consistent with FTA New Starts methodology.

¹⁷ Spillar, Robert J. 1997. Park-and-Ride Planning and Design Guidelines. 1995 William Barclay Parsons Fellowship Monograph #11. Parsons Brinckerhoff, New York, NY.

Evaluation Approach

As described earlier, the Sound Transit Ridership Model will be used to produce data related to changes in regional transit associated with the study alternatives. After the model is updated to reflect the most recent regional travel data, the model will be coded to reflect the build scenarios and then run to produce summary data tables. Daily ridership data for the study area will be provided by direct outputs from the ridership model. Outputs from the combined modeling system (which includes both the ridership model and the PSRC model) will include mode-split information and transit travel times.

Transit travel reliability will be qualitatively assessed for specific trips based on the proportion of the travel route for which transit has exclusive right-of-way versus when it uses right-of-way shared with other vehicles (e.g., exclusive rail line versus roadway lanes shared with either high-occupancy vehicle [HOV] or general purpose traffic), taking into account the projected levels of congestion on the shared facilities.

Specific trips for which transit travel times and reliability will be assessed will be identified in coordination with Sound Transit staff and/or cooperating agency staff. Possible trips may include the following routes, which incorporate the peak directions for both AM and PM peak periods, as well as the reverse peak direction for the PM peak period:

- AM Peak Period – Peak Direction (southbound) Trips
From Lynnwood and Shoreline to:
 - Northgate
 - University of Washington
 - Capitol Hill
 - Downtown Seattle
 - Sea-Tac Airport
 - Bellevue
- PM Peak Period – Peak Direction (northbound) Trips
To Lynnwood and Shoreline from:
 - Northgate
 - University of Washington
 - Capitol Hill
 - Downtown Seattle
 - Sea-Tac Airport
 - Bellevue

- PM Peak Period – Reverse Peak Direction (southbound) Trips

From Lynnwood and Shoreline to:

- Northgate
- University of Washington
- Capitol Hill
- Downtown Seattle
- Sea-Tac Airport
- Bellevue

Regional Traffic

Evaluation Criteria

As described earlier, output from the PSRC Regional Model: WSDOT Project Version will be the key data source for this analysis. The following types of data will be produced for design year 2035 to gauge the effect of the study alternatives on regional or systemwide traffic characteristics:

- Vehicle Miles of Travel (VMT)—Total average daily vehicle miles traveled on the regional highway system.
- Vehicle Hours of Travel (VHT)—Total average daily vehicle hours traveled on the regional highway system.
- Vehicle Hours of Delay (VHD)—Total average daily vehicle hours of delay on the regional highway system, which indicates the total level of congestion on the highway system.

Evaluation Approach

Information from the PSRC model will be used to generate the No Build Alternative and light rail alternative(s) VMT/VHT/VHD data. The PSRC model will be run in an iterative process with the Sound Transit Ridership Model, with highway traffic volumes reflecting changes in transit ridership and the ridership model reflecting changes in highway travel times. Matrices of vehicle trips and travel time per trip will be used to quantify estimated VHT, and matrices of vehicle trips and hours of delay per trip will be used to quantify the impact of project alternatives on VHD.

Surface Streets and Freeways

The methodology proposed for the surface street and freeway analysis is intended to be applied as consistently as possible throughout the corridor. The surface street system focuses on intersection operations and safety analysis while the freeway analysis will include measures such as density, travel time, and person-throughput.

Impacts on property access/circulation, parking, nonmotorized facilities, freight movement, construction, and safety will be addressed. The methodologies proposed to analyze the surface street system and freeway impacts are described in this section.

Corridor Traffic

Evaluation Criteria

Criteria used to evaluate effects at the broader corridor level will be based on a screenline-level analysis, which will include assessing the projected change in the following for proposed design year 2035:

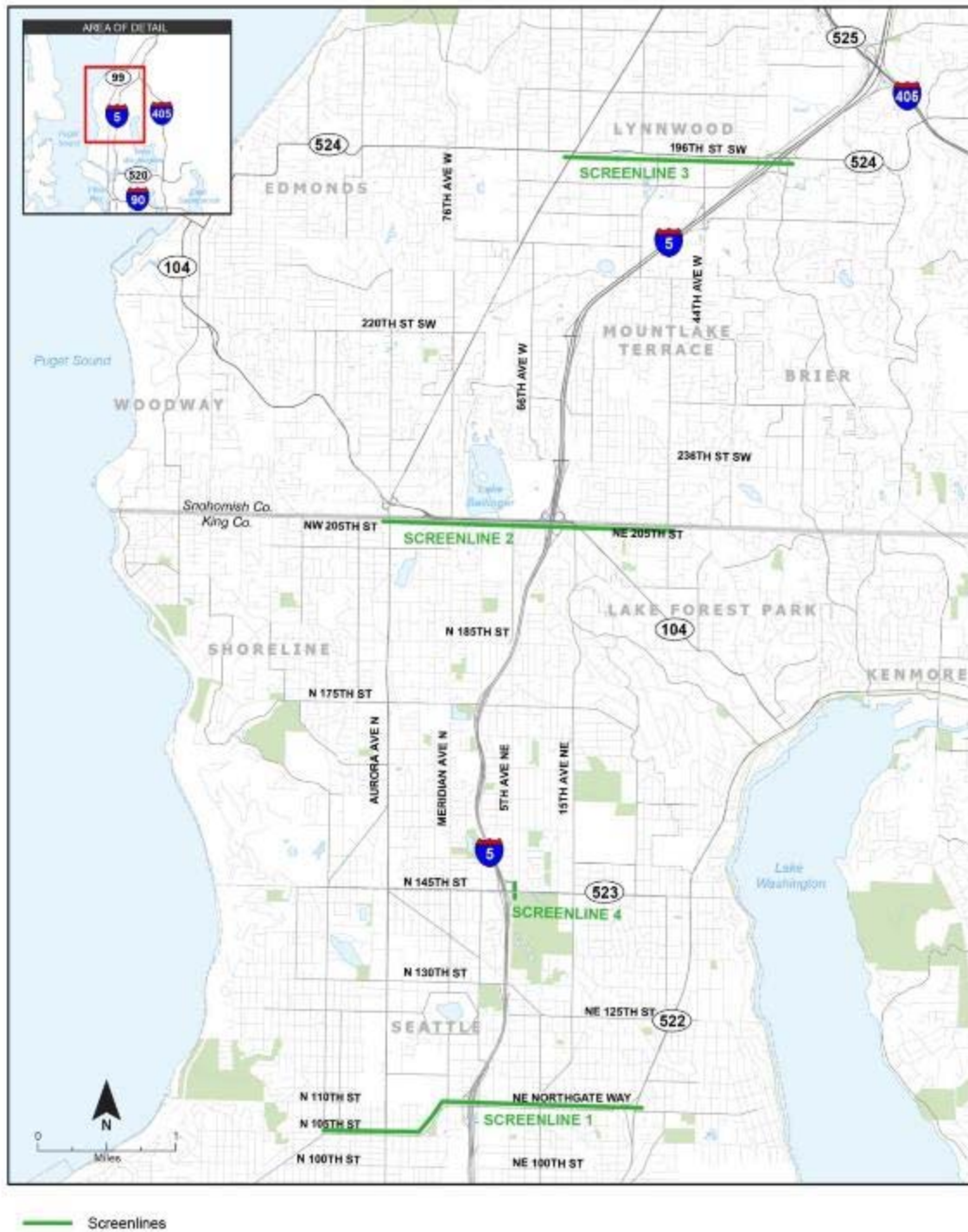
- Screenline peak hour and daily vehicle volumes;
- Screenline vehicle v/c ratios (converted to a generalized LOS); and
- Plots of congestion over time (for existing conditions only).

Evaluation Approach

The analysis of traffic impacts in various segments of the corridor will involve comparing projected traffic volumes on the highway and local street system at selected screenlines for each alternative. Screenlines are imaginary lines drawn across one or more roadways to compare aggregate changes in traffic volumes and person-moving capacities, etc. across all the facilities crossed by the line. A map and table will be used to present daily vehicle trips, AM peak hour trips, and PM peak hour trips at the four identified screenline locations.

The preliminary screenlines, shown in Figure A-4, are:

- Screenline 1—north of North Northgate Way/NE 110th Street
- Screenline 2—south of North 205th Street
- Screenline 3—south of 196th Street SW
- Screenline 4—on NE 145th Street east of 5th Avenue NE



Source: North Corridor transit Project Transportation Analysis Methodology Report

Figure A-4. Analysis Screenlines

The screenline comparisons will provide a snapshot of traffic operations along each corridor. Information from the PSRC and Sound Transit models that will be presented for each screenline will include AM peak hour, PM peak hour, and daily values.

In addition to the screenline totals, the v/c ratios may also be shown separately by key arterials and highways.

Local and Sub-Regional Bus Service

This section describes the analyses that will evaluate projected changes to local and sub-regional (e.g., *Swift*, *RapidRide*) bus service that would be affected by the study alternatives.

Evaluation Criteria

The following evaluation criteria will be considered for changes in local and sub-regional bus service for design year 2035:

- **Ridership**—Daily and peak period boardings by alternative and study year will be produced for selected local and sub-regional bus routes.
- **Transit quality of service**—This will be measured by assessing changes in transit service frequency, hours of service, passenger load, and effects on transfers consistent with the *Transit Capacity and Quality of Service Manual* standards and guidelines.

Evaluation Approach

The transportation team will assess the expected effects on existing local and sub-regional bus service using both qualitative and quantitative information. Expected changes in transit routing under the build alternatives will be identified and compared to routing under baseline conditions. The comparison will focus on changes in coverage area (including consideration of walk and bicycle distance to bus stops) and potential effects on speed and reliability (based on traffic operations results and/or other traffic analysis data). Traffic analysis results will be used to gauge potential travel time effects on routes operating on I-5. Modeled changes in ridership will be reported as well.

Intersection Operations (including Station Area/Park-and-Ride Traffic Analysis)

Evaluation Criteria

Effects on intersection operations will be evaluated based on the calculated design year 2035 peak hour intersection LOS. LOS measures the quality of traffic operations at an intersection in terms of both operational conditions and their perception by motorists. As described in Table A-2, LOS ratings range from A to F. LOS A represents the best operation and LOS F the poorest operation.

Table A-2. Level of Service Definitions for Signalized and Unsignalized Intersections

LOS	Average Control Delay (seconds per vehicle)		Traffic Flow Characteristics
	Signalized Intersection	Unsignalized Intersection	
A	≤ 10	≤ 10	Virtually free flow; completely unimpeded.
B	> 10 and ≤ 20	> 10 and ≤ 15	Stable flow with slight delays; less freedom to maneuver.
C	> 20 and ≤ 35	> 15 and ≤ 25	Stable flow with delays; less freedom to maneuver.
D	> 35 and ≤ 55	> 25 and ≤ 35	High density but stable flow.
E	> 55 and ≤ 80	> 35 and ≤ 50	Operating conditions at or near capacity; unstable flow.
F	> 80	> 50	Forced flow; breakdown conditions.

Source: 2010 Highway Capacity Manual, Transportation Research Board.

Agency Thresholds

As part of each agency's comprehensive planning efforts, agency transportation goals and LOS standards are developed. While each agency accepts different levels of congestion, a delay-based intersection LOS analysis has been preliminarily accepted by each agency. Delay is expressed in terms of average delay per vehicle, in seconds, experienced due to the intersection operations. LOS definitions for signalized and unsignalized intersections are included in Table 2. Overall, if a given intersection's operations are better than the LOS standard for each agency with the light rail alternative, then that intersection is considered to meet the agency's standard and does not require mitigation. In situations where the intersection operates worse than the agency's LOS standard without the light rail alternative, then mitigation is only required if the intersection delay and/or LOS degrades further with the build alternative. Further definition of this approach and the LOS standard(s) for each agency is summarized in Table A-2a and described below.

Table A-2a. LOS Standards for Affected Agencies

Agency	LOS Standard
Washington State Department of Transportation	LOS D for highways of statewide significance (HSS) LOS E/mitigated for regionally significant state highways (non-HSS)
City of Lynnwood	LOS E for City Center arterials LOS D for non-City Center arterials LOS C for local streets
City of Mountlake Terrace	LOS D for signalized intersections with the following exceptions (LOS E): <ul style="list-style-type: none"> • 212th Street SW • 244th Street SW • 220th Street SW between SR 99 and I-5 LOS E for unsignalized intersections

Table A-2a. LOS Standards for Affected Agencies

Agency	LOS Standard
City of Shoreline	LOS D for signalized intersections LOS D for unsignalized intersecting arterials Volume-to-capacity ratio of 0.90 or lower for principal and minor arterials
City of Seattle	LOS D (goal)

Washington State Department of Transportation

For state highways of statewide significance (HSS), such as I-5 and portions of SR 99 (King County) and SR 104 (NE 205th Street), the operating threshold in urban areas is LOS D. For regionally significant state highways (non-HSS), such as SR 99 (in Snohomish County), SR 524, SR 104 (Ballinger Way NE), and SR 523 (North/NE 145th Street), the operating threshold is LOS E/mitigated, meaning that congestion should be mitigated when the PM peak hour LOS falls below LOS E (i.e., LOS F).

City of Lynnwood

The operating threshold for signalized intersections is LOS E for City Center arterials and LOS D for non-City Center arterials. The operating threshold for local streets is LOS C. Only signalized intersections are considered as part of the Lynnwood Transportation Concurrency system. LOS failures at unsignalized intersections are separately addressed under the SEPA review of new developments.

City of Mountlake Terrace

Signalized intersection operations within Mountlake Terrace are to meet LOS D at a minimum, with exceptions along the following corridors, for which a minimum LOS E is acceptable: 212th Street SW, 244th Street SW, and 220th Street SW between SR 99 and I-5. The operating threshold for unsignalized intersections is LOS E.

City of Shoreline

To assess intersection operations, the operating threshold is LOS D for signalized intersections on arterial streets and at unsignalized intersecting arterials in Shoreline. The v/c ratio on one leg of an intersection may exceed 0.90 when the intersection operates at LOS D or better. For principal and minor arterials, a v/c ratio of 0.90 or lower is considered acceptable.

City of Seattle

The City of Seattle's goal is to maintain intersection operations at LOS D or better. However, within the Seattle metropolitan area, arterial LOS standards are defined based on the PM peak hour directional v/c ratio at designated screenlines. For the

City of Seattle's concurrency management system, v/c ratios are averaged across a series of parallel arterials to determine if the LOS threshold has been exceeded. At the northern city limit, where there are limited or no options to increase capacity and/or where growth is expected, a v/c ratio of up to 1.2 (LOS F) is considered to be acceptable (at a v/c ratio of 1.20 or greater, significant traffic congestion and vehicle queuing at intersections would be expected). When the calculated LOS for a screenline approaches the LOS standards, strategies would be pursued to reduce vehicular travel demand and/or increase the operating capacity across the screenline.

Evaluation Approach

Trip Generation

Information on transit station trip generation for 2035 will be developed from the Sound Transit model and will be assigned to various modes of travel based on data from the *2008 BART Station Profile Study* (BART and Corey, Canapary & Galanis Research 2008), and recent data collected from the Tukwila park-and-ride station. The BART study is a mode of access and egress survey of BART rail users in the San Francisco Bay area. This survey characterized the different modes people choose to access and depart from the stations such as walking, bicycling, driving alone, driving with others, being dropped off, using a transit transfer, or other modes. This information is presented by each station type, which is based on the type of station facilities provided and the surrounding land uses.

The vehicle and pedestrian trips associated with the light rail station ridership forecasts for the highest ridership full length alternative will be used for evaluating station area effects. Exceptions will be made at locations where there are substantial differences between alternatives (e.g., one has a park-and-ride, and one does not); in these cases, two different scenarios may be evaluated at affected locations. For park-and-ride stations, the analysis will assume that the park-and-ride lot is full for the purposes of providing a conservatively high estimate of automobile trips to and from each station. The automobile traffic volumes will be added to the future No Build Alternative automobile traffic volumes as the basis to analyze the light rail alternatives. This approach yields a conservatively high forecast of automobile trips for the light rail alternatives because it does not reflect the shift to transit as people replace their vehicle trip and use light rail. Trips will be assigned to the pedestrian and vehicular networks around the station locations based on existing and anticipated future traffic circulation patterns.

Level of Service Analysis

Synchro (version 7.0) software will be used to determine the projected 2035 AM and PM peak hour LOS at signalized and unsignalized intersections identified above, under "Intersections to be Studied." The HCM report from the Synchro software

will be used to summarize average intersection delay, LOS, and critical queue lengths. The signalized intersections LOS will be defined in terms of average intersection delay. Delay is dependent on two factors: (1) the capacity of the intersection as defined by the number of lanes, lane widths, pedestrian volumes, and other features; and (2) signal timing. Capacity, delay, and LOS are calculated for each traffic movement or group of traffic movements at an intersection. The weighted average delay across all traffic movements determines the overall LOS for a signalized intersection.

The LOS at an unsignalized intersection is also defined in terms of delay, but only for the approach that is stop-controlled, which is typically the minor street. For unsignalized intersections that are stop-controlled on each approach, the average intersection delay is reported. LOS definitions for signalized and unsignalized intersections are provided in Table 2.

Default values for the analysis will be developed for intersections where actual values are not available. These will include assumptions with respect to saturation flow rates, geometry, traffic, and signalization conditions. Table A-3 provides preliminary assumptions for existing input values where data have not been collected. For future input values, also listed in Table 3, assumptions are also typically made in terms of how traffic patterns change and traffic signals operate.

Table A-3. Default Synchro Parameters and Assumptions

Arterial Intersection Parameters	Condition	
	Existing Year 2012	Design Year 2035
Peak Hour Factor	From count and by each approach, default provided 0.90	Use 0.95 for all intersections except where existing Peak Hour Factor (PHF) is greater than 0.95 or less than 0.70. Use existing PHF in cases where the PHF is greater than 0.95. If existing PHF is less than 0.70, then increase factor by 0.20.
Conflicting Cyclists and Pedestrians per Hour	From traffic count, otherwise assume 10 pedestrians/cyclists in both AM and PM periods	For the No Build Alternative, apply growth rate from adjacent street to existing volumes. For the light rail alternatives, add the number of pedestrians based on the station ridership and mode of access forecasts.
Area Type	"Other" for all areas	Same as existing
Ideal Saturation Flow (for all movements)	1,900 vehicles per hour	Same as existing
Lane Utilization	Default software assumptions unless data/ engineering judgment suggests otherwise	Same as existing
Lane Width	From field sheets, agency in-house Synchro files or paint Line drawings (i.e., WSDOT)	Same as existing, unless improvements proposed, then use agency standards/plans.

Table A-3. Default Synchro Parameters and Assumptions

Arterial Intersection Parameters	Condition	
	Existing Year 2012	Design Year 2035
Percent Heavy Vehicles	From count, otherwise 2%	Same as existing
Percent Grade ^a	From as-built drawings, agency in-house Synchro file, or field sheets	Same as existing
Parking Maneuvers per Hour	Based on parking regulations. For less than 15-minute parking, assume 4 maneuvers per hour; otherwise, assume 1 maneuver per hour, unless data/information gathered or provided from agencies suggest otherwise.	Same as existing. For new parking, assume existing assumptions for maneuvers based on parking durations.
Bus Blockages	Headway information provided by transit agencies	Use future service assumptions developed by Community Transit, King County Metro, and Sound Transit as part of the Transit Service Integration Plan.
Intersection Signal Phasing and Coordination	From agency signal phasing sheets or their existing analysis files	Same as existing. For timing adjustments: Left turns, if permissive in existing, will be examined for a protected phase based on LOS, access/geometry, safety, and agency guidance. For build: Any left-turn conflict with at-grade light rail will include a separate lane and have protected phasing. Left turns will be restricted (or protected with a gate or similar treatment) at unsignalized intersections. For elevated light rail, mid-block left turns will be restricted.
Intersection Signal Timing Optimization Limits	Not applicable	Between 60 to 120 seconds
Minimum Green Time	Not applicable	Based on pedestrian times (minimum of 4 seconds walk time and 4 feet per second for flashing don't walk [FDW] clearance). If no crosswalk: 10 seconds
Yellow and All Red Time	Not applicable	New signals: (Y) = 4 seconds and (R) = 1 second
Right Turn on Red	Allow	Same as existing
Right Turn Overlaps	Signal timing plans	Identify if used
50th and 95th Percentile Vehicle Queues	Based on 25 feet per vehicle	Same as existing

^a Percent grade assumed for at-grade intersections only.

Note: Delay-based LOS results will be reported from Synchro's HCM Reports.

Freeway and Ramp Operations

Evaluation Criteria

Locations where freeway access will be modified will be identified. Where appropriate, selected freeway segments at those locations will be analyzed where freeway traffic operations are anticipated to be affected by the proposed interchange modifications. For those segments, the Transportation Technical Report will describe and analyze the following types of data related to freeway traffic operations for design year 2035:

- AM and PM peak hour LOS for selected freeway mainline segments and ramps. Notable areas of congestion will be noted and described.
- AM and PM peak hour travel times will be reported for selected freeway segments (e.g., Lynnwood Transit Center to Northgate Transit Center).
- AM and PM peak hour travel speeds for selected freeway segments.

LOS is a measure that characterizes the operating conditions, as perceived by a driver or facility user, of a highway, street, or other transportation facility. Although LOS is a qualitative measure, it is based on quantitative measures, such as traffic density, average speed, or average vehicle delay depending on the facility type and function. A range of six LOS designations, ranging from A to F, is defined in the HCM for limited access facilities. LOS A represents ideal, uncongested operating conditions, while LOS F designates extremely congested, breakdown conditions. LOS B through LOS D designate intermediate operating conditions, while LOS E denotes congested conditions at the point of maximum service rate. LOS for either freeway segments or multi-lane highway segments is derived from traffic density and classified according to the ranges shown in Table A-4. Note that intersection LOS at ramp termini will also be categorized using intersection-based LOS measurements.

Table A-4. Level of Service Designations for Freeways or Multi-lane Highways

LOS (Freeway/Highway Segments)	Density Range (pcpmpl)
A	0–11
B	> 11–18
C	> 18–26
D	> 26–35
E	> 35–45
F	> 45

pcpmpl = passenger car equivalents per mile per lane.

Source: Transportation Research Board Highway Capacity Manual (2000).

Evaluation Approach

VISSIM traffic micro-simulation software will be used to assess design year 2035 AM and PM peak hour freeway operations for specific locations where the build alternatives are expected to affect freeway operations. The network coding within the VISSIM software will be built based on as-built plan sheets or aerial photographs. Any design changes associated with the light rail alternatives will be coded into the network to satisfy the design requirements of the state and will be consistent with the latest WSDOT Design Manual. Table A-5 identifies some of VISSIM's additional inputs and assumptions that will be incorporated into the analysis. VISSIM outputs will produce mainline and ramp junction LOS and selected travel times and speeds.

Table A-5. VISSIM Freeway Parameter Methods and Assumptions

Freeway Parameter	Existing Year 2012	Design Year 2035
Deceleration Lane Length	From as-built drawings or aerial photographs	Same as existing or from design plans
Acceleration Lane Length	From as-built drawings or aerial photographs	Same as existing or from design plans
Grade	From as-built drawings, if not, assume 0%	Same as existing
Superelevation ^a	Assume 0%	Same as existing
Pavement Type	Assume dry concrete	Assume dry concrete
Desired Free-Flow Speed	60 mph	Same as existing
Car Following Sensitivity Factor (CFSF)	Variable	Same as existing
Truck %	From traffic data	Same as existing
Carpool/HOV %	From field data	From demand modeling information
Mainline and Ramp Link Traffic Volumes	From traffic data	Estimated using growth rates from highway demand model
Lane Distribution (for entering links)	Assume even distribution over all entering lanes	Assume even distribution over all entering lanes
Vehicle Type Specifications	Assume default vehicle type specifications	Same as existing
Warning Sign Distance (for on-ramps)	From as-built drawings, variable depending on freeway conditions and geometry	Same as existing
Warning Sign Distance (for off-ramps)	From as-built drawings, variable depending on freeway conditions and geometry	Same as existing
Ramp Metering	Will be coded as fixed-time	Will be coded as fixed-time
VISSIM Output (<i>pcphpl</i> = per car; per hour; per lane)	Segment density (in terms of <i>pcphpl</i>) and corridor travel time	Segment density (in terms of <i>pcphpl</i>) and corridor travel time
Number of Simulations	Results will be taken as an average of up to five simulations	Same as existing

^a Driver behavior parameters and lane change distances are key inputs and will be used as a calibration technique to match field conditions.

Property Access and Local Circulation

This area of evaluation will assess local area traffic impacts including access to properties. The focus will be on impacts during both construction and full build out of the project.

Evaluation Criteria

The evaluation criteria will include any physical change in access to properties.

Evaluation Approach

In addition to the analysis of intersection LOS and delay impacts, traffic impacts on local circulation will be assessed qualitatively. This assessment will include such factors as:

- Effect of potential street closures on localized traffic movement
- Potential for neighborhood traffic intrusion associated with either light rail stations or trackway
- Loss of left-turn access to and from driveways for at-grade and elevated light rail alternatives
- Changes in property access

Parking

Parking supply varies throughout the project corridor. Large supplies of free private parking are available in Lynnwood, Mountlake Terrace, Shoreline, and Northgate. Demand for parking spaces varies depending upon location throughout the corridor, with relatively high demand at existing park-and-ride facilities in Lynnwood, Mountlake Terrace, Shoreline, and Northgate; moderate demand at business districts and activity centers in Lynnwood, Mountlake Terrace, Shoreline, and Northgate; and relatively low on-street demand in residential neighborhoods surrounding the I-5 corridor.

Evaluation Criteria

Analysis of the impacts of light rail on existing on-street and off-street public parking will focus on the loss or reconfiguration of existing on-street and off-street parking supply due to light rail station and trackway development.

Evaluation Approach

The evaluation of parking impacts will include an inventory of parking supply and utilization in locations where parking is anticipated to be affected by the project; in addition, changes to the parking supply and utilization due to the project will be assessed.

Inventory of Parking Supply and Utilization

The analysis of light rail impacts on existing patterns of on-street parking supply and demand will generally be limited to one block on either side of the proposed light rail alignments. A parking inventory and utilization survey will be conducted for all potential rail alignments that are within the road right-of-way.

At station areas, parking inventory and utilization surveys will be conducted within 0.25 mile of each station. Within this area, an inventory of existing on-street and off-street parking spaces will be developed. Inventory data will be stratified by type of parking (i.e., time-limited parking, free parking, loading zone, private, etc.) and location (i.e., block face, business name, or other distinguishing feature). Where available, data from local agencies will be used to initiate the inventories near the station locations. The analysis will focus on locations that may be specifically affected by light rail alignments, including both available parking and internal site circulation. Where data are not available from local agencies, data will be collected through field surveys. Data will include a space occupancy count by block face or lot taken once during weekday mid-morning or mid-afternoon hours. This time period represents typical conditions for parking demand.

Assessment of Parking Impacts

The assessment of parking loss will be based on review of the inventory of parking supply and demand coupled with an evaluation of the conceptual drawings for each build alternative. These concepts should identify specific locations where changes would be made to the existing parking supply. Comparison between existing demand and the supply remaining after construction of each light rail alternative will form the basis for identification of parking loss associated with each alternative. This comparison will also address the potential significance of that loss in relation to parking utilization and will facilitate the identification of possible mitigation strategies. The loss of existing parking spaces will be stratified by both location and type.

Park-and-ride lot demand will be estimated at an aggregate level for the project corridor area and then allocated to individual stations based on an assessment of the GIS-based calculated 15-minute automobile “access shed” (an access shed of 25 minutes will be used for Lynnwood Transit Center Station because it will be the terminus of the line). This estimate will be combined with an assessment of the physical and policy-related potential for parking at a given location. The estimated park-and-ride demand will then be compared to the proposed supply to determine the potential for spillover parking impacts on the surrounding area. Park-and-ride demand will be forecasted for day of opening and horizon year conditions. A combination of approaches will be used including results from the Sound Transit Ridership Model and an empirically based sketch-planning park-and-ride demand

estimation technique developed using data from the Puget Sound region¹⁸. Results from each of these methods will be reviewed by the transportation team and Sound Transit and a final range of park-and-ride demand estimates will be determined.

Nonmotorized Facilities and Modes

The light rail alternatives will be qualitatively assessed regarding existing and future pedestrian and bicycle facilities. Specific issues to be discussed and assessed include the following:

- Pedestrian access and circulation in the vicinity of the proposed station in relation to the forecasted ridership.
- Direct (physical) effects on pedestrian and bicycle facilities along the alignment of each alternative.
- Barriers to nonmotorized (pedestrian and bicycle) traffic movement introduced by the light rail alternative.
- Intersection crossing issues associated with station layout and connections to major pedestrian routes and destinations.
- Missing sidewalk sections for city arterials within 0.50 mile of proposed station locations.
- Impacts on recommended school walk routes.
- Existing and funded regional bicycle paths, routes, and deficiencies within 1.0 mile of proposed station locations, and a general quantification of how major multi-use trails/paths are used (i.e., by commuters or recreational users).

A pedestrian LOS analysis will also be conducted for sidewalks at intersections within one block or approximately 300 feet of each proposed station entrance (the study area may exceed one block or 300 feet from the station depending on the location of transfer points or nearby pedestrian generators). The *Transit Capacity and Quality of Service Manual* and HCM methodology for determining sidewalk LOS will be used for this analysis. This methodology produces a score that indicates the pedestrian's perception of the travel experience, and is based on the average pedestrian space and average flow rate. Additional factors such as station layout, adjacent land uses, connections to nearby pedestrian routes and destinations, and potential queue locations will be considered and qualitatively discussed as part of the sidewalk analysis.

¹⁸ Spillar, Robert J. 1997. Park-and-Ride Planning and Design Guidelines. 1995 William Barclay Parsons Fellowship Monograph #11. Parsons Brinckerhoff, New York, NY.

Freight

Evaluation Criteria

Evaluation criteria may include the following:

- Change in congestion levels and/or travel speeds along major freight facilities
- Physical impacts on truck loading zones or access to local businesses

Evaluation Approach

Impacts of the light rail alternatives on freight movements will be qualitatively assessed. This assessment will focus on truck movement and truck routing impacts because freight rail corridors do not exist in the study area. The assessment of truck issues will focus on impacts on major truck routes (including I-5) and truck service areas, access to truck depots or intermodal yards, and loss of on-street loading zones and/or modifications of truck access to local businesses.

Construction

Evaluation Criteria

Two primary sources of construction impacts on local traffic will be considered from a generally qualitative standpoint:

- Impacts on traffic operations, property access, and parking supply related to potential road, sidewalk, bicycle, or other transportation facility closures during construction
- Impacts of construction-related traffic on traffic operations

Evaluation Approach

The assessment of construction-related traffic impacts will focus primarily on I-5 mainline and ramps, principal and minor arterials, or on streets that could be significantly affected by construction of one or more of the light rail alternatives. For the purposes of impact assessment, the construction stage considered to be most disruptive to traffic operations in the corridor will be the one analyzed in the most detail. The transportation team will identify this stage in coordination with Sound Transit staff and staff from local jurisdictions as appropriate.

Construction traffic analysis will consider the following:

- Identification of changes in roadway capacity including potential lane closure requirements, parking restrictions, pedestrian or bicycle facility impacts, alignment shifts, areas of construction activity adjacent to travel lanes, or other reductions to capacity due to transit facility construction activity;
- Impacts on transit and emergency services

- Impacts on school transportation services during construction
- Impacts of construction-related activity on on-street parking supply
- Identification of potential construction staging areas, including access and impact on roadway operations
- Identification of potential construction access and truck routes and the impact of construction-related traffic on these routes
- Assessment of potential for neighborhood traffic intrusion related to road closure and options for traffic detour
- Estimation of construction truck traffic
- Identification of areas that would require construction coordination between Sound Transit and other governmental agencies
- Development of mitigation measures

The analysis will be summarized in a tabular format to identify the following:

- Impact location(s)
- Street characteristics
- Type of construction activity including likely duration of impact (short term versus long term)
- Level of construction traffic (characterized as high, moderate, or low). High truck traffic is associated with major fill, excavation, and concrete work such as with tunneling. Moderate truck traffic generally refers to activities not associated with major fill or excavation work. Low truck traffic occurs when none of the construction activities associated with moderate or high truck traffic occurs.
- Full or partial road closures
- Availability of detour routes
- Potential for detoured traffic to affect a residential neighborhood. (This is characterized as high, medium, or low and is related to both potential for road closure and options for traffic detour.)
- Loss of on-street parking. (This may be characterized as “yes” for parking loss and “no” for no parking loss. Additionally, there may be some temporary loss of off-street parking due to the location and operation of construction staging, as well as construction worker parking.)
- General comments highlighting key issues for each location related to construction traffic activity that do not fall into one of the above categories. This may include the following:
 - a. Identify capacity issues, impact on parking/access
 - b. Identify construction routes and staging areas

Safety

Potential effects of the project on safety will be assessed qualitatively for all modes within the study area including general traffic, transit, freight, bicycle, and pedestrian modes.

Evaluation Criteria

Evaluation criteria could include the following:

- Effect on general purpose traffic safety
- Effect on transit operations safety
- Effect on freight travel safety
- Effect on nonmotorized travel safety

Evaluation Approach

A safety (accident/crash) analysis will be used to assess accidents currently occurring within the project limits in terms of the following:

- Type
- Cause
- Frequency

Accident data from the latest 3 years will be compiled and summarized to identify any current safety deficiencies. Unique accident patterns (e.g., high frequency of a specific pattern) will be noted. The accident data will be collected for any directly affected local intersections, roadways, and I-5 mainline and ramps. An intersection and roadway safety analysis will be conducted only where the light rail alternatives are proposed to be either at-grade in semi-exclusive right-of-way, elevated within or immediately adjacent to the road right-of-way, or results in a physical change to a roadway. Along the local streets, a qualitative discussion of how the project may affect accident type and frequency will be developed and presented.

No accident analysis or safety conclusions for alternatives proposed to operate outside the roadway right-of-way (exclusive right-of-way) will be conducted other than where (if) the alternative physically changes the geometry of a roadway facility (e.g., park-and-ride entrances).

Safety effects on freight and road-based transit travel will be assessed based on projected changes in traffic volumes and/or modal conflicts along key routes. Safety effects on bicycle and pedestrian travel will be assessed based on change in conflicts with motorized modes, as well as change in facilities provided for their travel. This assessment will include consideration of children walking and bicycling to school and drop-off, pick-up, and school bus zones.

Development of Detailed Traffic Volumes by Analysis Scenario

In many instances, the methodology for analyzing a particular measure is the same across all time periods, analysis years, and given alternative. However, in the development of detailed traffic volumes for use in traffic impact assessments, some differences exist between different types of analysis scenarios. This section describes the differences in methodology that will be employed depending on the scenario to be analyzed.

Existing Conditions

Peak hour freeway, arterial roadway, and intersection-turning movement volumes will be compiled from traffic volume counts. These will form the basis upon which traffic volumes for other analysis scenarios will be developed.

Future Baseline (No Build)

For future baseline conditions, growth rates produced by the PSRC Regional Model will be applied to existing traffic volumes to develop future forecasted arterial and freeway traffic volumes.

Light Rail Alternative(s) and Construction Scenario(s)

Similar to the future baseline conditions, traffic volumes for the light rail alternatives will be developed based on proportionate change in volumes from the regional model between the future baseline volumes and the alternative in question. Note that the regional model will reflect the effects of transit ridership derived from the Sound Transit Ridership Model. Changes in traffic volumes will generally be assessed at an aggregate level (e.g., screenlines) and as implied by system measures such as VMT. For localized impacts such as in the vicinity of park-and-ride lots, the No Build Alternative volumes will be used as a base, with additional volumes added to reflect traffic anticipated to be generated by the given facility.

The effect of selected construction scenarios on traffic operations will be evaluated in a qualitative manner, although some analysis at spot locations may be conducted using volumes for the opening year of the No Build Alternative.

Indirect Effects

Indirect effects are those project effects that occur later in time or some distance from the project. Typical indirect effects are those associated with changes in land use development patterns, typically consistent with adopted plans and zoning, and associated with changes in transportation accessibility over time. These effects are described in the land use and specific resource reports, but the potential changes in transportation access that could lead to these effects will be discussed qualitatively in the Transportation Technical Report.

Cumulative Effects

The analysis of future traffic and transit impacts of the project will be cumulatively assessed based on the results of traffic modeling and ridership modeling that incorporates past, funded, and approved future actions, as well as projected growth that would result from development in the region.

The assessment of additional cumulative transportation effects will include qualitative evaluation and discussion of past, present, and reasonably foreseeable future actions that could interact with the project alternatives, and that were not included in the traffic modeling. These may include, but are not limited to, consideration of effects from actions such as the following:

- Extension of light rail from Lynnwood to Everett
- Highway/lane management, such as from the implementation of tolls on state and/or local facilities, that could further alter travel behavior in the corridor
- Construction activities from other transportation projects that could affect or be influenced by the project construction activities
- Local developments and public infrastructure projects that could contribute to cumulative traffic delays on local arterial streets over the construction period

Transportation Data Developed for Use by Other Disciplines

Air Quality Effect Analysis Data

To support the air quality effect analysis, the following types of data will be produced for the study alternatives:

- AM and PM peak hour traffic volumes, speeds, and vehicular class for all roadway intersections that will be affected by changes in travel and traffic patterns caused by study alternatives.
- Daily VMT estimates by speeds for two areas: Lynnwood Link Extension study area and the regional system. These estimates will be provided in a tabular format for mobile source and greenhouse gas analyses.
- Level of service at affected intersections.
- The above information will be provided for existing conditions and the design year (2035), and the design year information will be extrapolated to 2040 for air quality conformity analyses.

Noise Effect Analysis Data

To support the noise effect analysis, the following types of data will be produced by the transportation team:

- AM and PM peak hour Synchro model files and general systemwide vehicle classification information.
- Maximum AM and PM peak hour free-flow volumes. These will be estimated by calculating 80 percent of the roadway capacity as indicated in the PSRC Regional Model. This will be for all links associated with the intersections analyzed in the Synchro traffic simulation analysis.
- The above information will be provided for existing conditions and the design year (2035).

Energy Effect Analysis Data

Energy effects will be calculated for operational and construction phases of the project. To determine operational energy effects, the following types of data for year 2035 will be produced by the transportation team:

- Daily regional VMT and VHT
- Daily light rail transit/bus rapid transit and/or HOV VMT

Environmental Justice and Social Impact Analysis Data

To support the environmental justice and social impact analysis, a variety of data will be produced by the transportation team, including the following:

- Estimated travel sheds as determined by using the travel demand model to identify transportation analysis zones relevant to environmental justice and social impact analysis
- Estimated travel times to selected destinations (e.g., Seattle central business district, Capitol Hill, First Hill, University of Washington) for use in the analysis of access to employment centers, education, and medical services for environmental justice populations
- Analysis of temporary or permanent impacts on Americans with Disabilities Act (ADA) parking or designated parking at social services, as well as percentage of parking spaces temporarily or permanently lost in designated commercial shopping districts
- Change in level of service on corridor roadways

Mitigation Measures

Project Design Measures and Best Management Practices

As long-term impacts are identified and mitigation options developed, these options will be forwarded to Sound Transit staff and the design team for engineering design/refinement and development of approximate cost estimates. The analysis of mitigation options will be coordinated with the relevant local/state jurisdictions to

identify strategies that may be under consideration to address other regional transportation challenges, but which could benefit the light rail project.

Mitigation

Direct Impacts

Potential mitigation measures will be described to address potential transportation impacts associated with the build alternatives.

- **Local Traffic Impacts:** Based on the 2035 traffic analysis, opportunities for mitigation of long-term impacts will be identified for the intersections that do not meet the established LOS standards previously discussed. These measures might include operational changes such as signal phasing, timing, or physical modification such as added travel or turning lanes. For intersections that do not meet the established LOS standards in the no build condition, the build alternatives are only obligated to bring the operating conditions back to the no build condition. Determining if an intersection meets the agency LOS standards will be based on the conditions at each individual intersection.
- **Parking:** Areas for potential parking mitigation will be identified by considering the potential for hide-and-ride parking activity in the neighborhoods surrounding transit stations. Areas with a high potential for hide-and-ride activity will be identified with potential mitigation strategies to reduce the likelihood of this activity.
- **Construction:** Mitigation measures aimed at addressing the construction traffic impacts identified above will be developed and reviewed. As appropriate, this will include a review of measures proposed and/or used for Initial Segment, Airport, and University Link light rail construction. Mitigation measures identified to address local construction traffic impacts will also be reviewed for their relevancy in addressing regional and/or corridor level construction traffic issues.
- Potential improvements will also be identified to mitigate light rail project impacts on nonmotorized facilities, freight, and access restrictions to businesses.

Cumulative Effects

Sound Transit will coordinate with proponents of reasonably foreseeable future projects that are likely to be under construction at the same time as the Lynnwood Link Extension, as necessary, to minimize the potential cumulative impacts of overlapping construction periods and project operation.

Summary of Technical Activity by Analysis Year

Table A-6 shows the technical activities to be undertaken for each of the analysis years identified.

Table A-6. Summary of Technical Activities by Analysis Year

Activity	Existing (2012)	Design Year (2035)	Construction Period ^a
Regional traffic forecast measures	X	X	
Ridership forecasts		X	
Corridor traffic	X	X	X
Road-based transit	X	X	X
Intersection operations	X	X	X
Freeway and ramp operations	X	X	X
Property access and circulation	X	X	X
Parking demand	X	X	X
Nonmotorized modes	X	X	X
Freight	X	X	X
Construction impacts			X
Indirect effects		X	
Cumulative effects		X	
Transportation data for other disciplines:			
Air quality	X	X ^b	X
Noise	X	X	
Energy	X	X	
Environmental justice and social impact	X	X	

^a Construction period analysis will be qualitative.

^b Year 2035 forecasts will be extrapolated to year 2040 for conformity analyses.

Documentation

For this resource, the following documentation will be developed:

- EIS section
- Transportation Technical Report

TRANSPORTATION TECHNICAL ANALYSIS

METHODOLOGY: ADDENDUM FOR THE FINAL EIS

Introduction

A few refinements are being made to the Lynnwood Link Extension Project Transportation Technical Analysis Methodology as developed for the Draft Environmental Impact Statement (EIS). This memorandum describes the refined methods that will be used to analyze the impacts on transportation for the Lynnwood Link Extension Project Final FEIS. Elements within the following sections of the previous methodology report are being refined and are described in this memo:

- Intersections to be Studied
- Approach for Finalizing the List of Intersections to be Studied
- Individual Roadway Segments to be Studied
- Traffic Operations Analysis
- Intersection level of service Analysis
- Freeway and Ramp Operations
- Construction Evaluation Approach

Methodology Refinements

The ***Intersections to be Studied*** section in the methodology report provides a preliminary list of intersections to be analyzed. The following intersections will be studied in addition to those included in the original methodology report in order to include all I-5 ramp terminal intersections within the study area:

- 196th Street SW/Poplar Way
- I-5 Northbound ramps/Poplar Way
- I-5 Northbound ramps/SR 104
- I-5 Southbound ramps/SR 104

The methodology described in the ***Approach for Finalizing List of Intersections to be Studied*** section of the methodology report will be updated to include the criteria that all intersections with I-5 ramps will need to be analyzed for the build alternatives. Table 1 below is an updated table.

Table 1. Intersection Analysis Screening Process

Parameter	Threshold Value	Description
Critical Volumes	5%	Forecasts indicate that a critical volume comparison between a build option and the No Build Alternative would exceed the threshold value.
Change in Intersection Geometry	Changes in the number of lanes in any approach	Changes in intersection geometry resulting in the addition or deletion of a lane in any approach would change the capacity of the intersection and could affect LOS.
Change in Intersection Control	Traffic signal installation	The addition of a traffic control device such as a signal would affect the capacity for some traffic movements, and could change the overall LOS.
Crosswalk Lengths Across Major Streets	Increased crossing distance	Green traffic signal time for side streets would be extended and pedestrian clearances would be longer.
Intersection LOS	If the intersection operates with a delay value within 10% of the agency's LOS threshold	<p>Locations meeting the threshold criterion with the No Build Alternative would likely require further analysis.</p> <p>For example, if an intersection operates at LOS E (75 seconds) in no build and the LOS threshold is LOS E (80 seconds), the intersection is then included in the build analysis.</p>
Intersections with I-5 Ramps	Intersection is an I-5 ramp terminus intersection	For the segments of I-5 within the project area, all intersections with I-5 ramp termini will be analyzed for Baseline and Build conditions.

The ***Individual Roadway Segments to be Studied*** section in the methodology report previously stated that segments of I-5 between the 196th Street SW ramps in Lynnwood and the vicinity of NE Northgate Way in Seattle may be analyzed if the geometry of the mainline or interchanges in the

segment have changed due to the project, or if the project is estimated to add substantial traffic volumes to the mainline and/or interchanges. The methodology is being refined to analyze the entire length of I-5 between the 196th Street SW ramps in Lynnwood and the vicinity of NE Northgate Way in Seattle.

In the ***Traffic Operations Analysis*** section, the methodology previously stated that VISSIM will be used to assess freeway traffic operations at specific locations where the build alternative(s) are expected to affect freeway operations. The refined methodology will use VISSIM to analyze the entire I-5 corridor within the study area including ramp termini intersections. In addition, intersections adjacent to the Lynnwood Transit Center Station and 145th Street Station will be analyzed using VISSIM to better reflect congested operations.

In the ***Level of Service Analysis*** section, the methodology previously stated that Synchro will be used to determine AM and PM peak hour LOS at signalized and unsignalized intersections. The methodology is being updated to use VISSIM to report intersection delay and LOS where VISSIM is being used at ramp termini intersections and the Lynnwood Transit Center and 145th Street Station areas.

The ***Freeway and Ramp Operations*** methodology previously listed several measures of effectiveness including LOS, travel times, and speeds. Vehicle throughput will be included as a measure as needed in order to assess the freeway operations.

In the ***Construction Evaluation Approach*** section the methodology previously stated that the assessment of construction-related traffic impacts will focus primarily on I-5 mainline and ramps, principal and minor arterials, or on streets that could be significantly affected by construction of one or more of the build alternatives. For the purposes of impact assessment, the construction stage considered to be most disruptive to traffic operations in the corridor will be the one analyzed in the most detail. The transportation team will identify this stage in coordination with Sound Transit staff and staff from local jurisdictions as appropriate. The updated methodology for the FEIS will include a traffic analysis along I-5 for the AM and PM peak hours for the most disruptive construction stage that will be analyzed using VISSIM and will report expected effects on travel speeds.

APPENDIX B

Future Transportation Improvement Assumptions for the No Build Alternative

Key highway and transit projects included in the Lynnwood Link Extension project are same as those assumed in the SR 520 Final EIS model. These are listed below.

Highway Network

- SR 520—West Lake Sammamish Parkway to SR 202
- SR 520—Floating bridge replacement and associated improvements
- I-90—R8A: Phases I, II, and III
- SR 99—Alaskan Way Viaduct Seawall Replacement Program
- I-405—South Bellevue Widening Project
- I-405—NE 8th Street to SR 520 Braided Ramps
- SR 519—Intermodal Project: Phase 2
- SR 518—SeaTac Airport to I-5/I-405 Interchange: third eastbound lane

Transit Network

- The transit definition reflects transit services in Seattle, North King County, East King County, and South Snohomish County that affect the travel demand across Lake Washington.
- The Downtown Seattle Transit Tunnel (DSTT) will be used exclusively by light rail—buses will no longer utilize the DSTT.
- Transit priority on 3rd Avenue in downtown Seattle includes mid-day operations, in addition to the existing priority during morning and evening peak periods.
- Sound Transit (ST) Central Link light rail will operate from Lynnwood to Redondo/Star Lake.
- ST East Link light rail will operate between Lynnwood and Overlake Transit Center (OTC) during peak hours and between Northgate and OTC during off-peak periods.
- ST East Link light rail will include a tunnel alignment through downtown Bellevue.
- ST Sounder Commuter Rail service will operate south to Lakewood.
- First Hill Streetcar will use the two-way Broadway alternative.
- *RapidRide* bus service will operate along five bus rapid transit (BRT) corridors identified in King County's *Transit Now* measure.

Local Street Network

The following local street improvements were also included in the 2035 No Build Alternative for traffic operations analysis. These projects were included in each city's transportation improvement program and/or identified by each jurisdiction to be included in the 2035 No Build Alternative roadway network.

City of Shoreline

- Aurora Corridor Improvement Project

City of Mountlake Terrace

- 212th Street SW and 48th Avenue West - install a signal and reconfigure northbound leg to a right turn lane and a left turn lane
- 220th Street SW and 58th Avenue West - install a signal or one-lane roundabout
- 230th Street SW and 56th Avenue West - install a one-lane roundabout or all-way stop control
- 236th Street SW and 56th Avenue West - reconfigure intersection so that left turn lanes become left/through lanes. Restrict parking access in peak direction to allow for two receiving lanes during peak (westbound in AM, eastbound in PM)
- Gateway Boulevard - complete from 244th Street SW to 236th Street SW with pedestrian facilities and bicycle accommodations
- 236th Street SW and Gateway Boulevard - install a signal
- 236th Street between I-5 and 56th Avenue West - coordinate signals at 236th Street SW and northbound I-5 ramp, 236th Street SW and Gateway Boulevard, 236th Street SW and 58th Avenue W, 236th Street SW and 56th Avenue West
- 244th Street SW and 48th Avenue West - add an eastbound left turn lane
- 244th Street SW and Cedar Way - add turn lane and reconfigure intersection
- 220th Street SW and SR 99 - install a westbound right turn pocket

City of Lynnwood

New/Expanded Roads:

- 204th Street SW from 68th Ave West to SR 99
- 36th Avenue W from Maple Road to SR 99
- Poplar Extension Bridge
- Maple Road Extension
- 33rd Avenue West Extension
- 52nd Avenue West from 168th Street SW to 176th Street SW

- Beech Road Extension
- 200th Street SW from 64th Avenue W to 48th Avenue West – widen from 3 to 5 lanes

Intersection Improvements:

- Scriber Lake Road and 196th Street SW Traffic Signal Reconstruction
- 52nd Avenue W and 176th Street SW Roundabout/Traffic Signal
- Sears Driveway and Alderwood Mall Parkway Traffic Signal/Turn Lane
- 28th Avenue W and Alderwood Mall Boulevard Traffic Signal
- 48th Avenue W and 188th Street SW Roundabout/Traffic Signal
- 66th Avenue and 212th Street Traffic Signal
- 196th Street SW and Alderwood Mall Parkway Traffic Signal/Turn Lane
- 198th Street SW and 44th Avenue West Traffic Signal

City Center Improvements:

- 196th Street SW from 37th Avenue West to 48th Avenue W – Add BAT lanes
- 42nd Avenue W from 200th Street SW to 194th Street SW
- 44th Avenue W from I-5 to 194th Street SW – widen roadway
- 194th Street SW from 33rd Avenue West to 40th Avenue West
- 200th Street SW from 40th Avenue West to 48th Avenue West – widen from 3 to 5 lanes
- Right-in, right-out stop control at all new City Center streets bounded by 44th, 40th, 196th and 200th.

APPENDIX C

Detailed LOS Analysis Reports and Arterial Roadway Volumes

Station/Intersection AM Peak Hour Operations (LOS/Delay)

Station/Intersection AM Peak Hour Operations (LOS/Delay)

Segment A	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
130th Street Station												
N 130th Street and Aurora Avenue N	Signal	D	LOS	D	D	D	D	*	D	D	D	D
		WSDOT HSS	Delay	51	52	52	52	*	52	52	52	52
N 130th Street and Meridian Avenue N	Signal	D	LOS	B	B	B	B	*	B	B	B	B
		CoS	Delay	14	14	15	14	*	15	15	14	15
N 130th Street and 1st Avenue NE	Signal	D	LOS	C	C	C	C	*	C	C	C	C
			Delay	26	28	27	28	*	27	27	28	27
NE 130th Street and I-5 Southbound On-Ramp	TWSC	D	LOS	A	A	A	A	*	A	A	A	A
			Delay	7	5	6	5	*	6	7	5	7
5th Avenue NE and Park-and-Ride Driveway (north)	TWSC	D	LOS	*	*	*	*	*	*	A	*	A
			Delay	*	*	*	*	*	*	3	*	3
5th Avenue NE and Park-and-Ride Driveway (south)	TWSC	D	LOS	*	*	*	*	*	*	A	*	A
			Delay	*	*	*	*	*	*	4	*	4
5th Avenue NE and Park-and-Ride Driveway (church)	TWSC	D	LOS	*	*	A	*	*	A	*	*	*
			Delay	*	*	6	*	*	6	*	*	*
NE 130th Street and 5th Avenue NE	Signal	D	LOS	C	C	C	C	*	C	C	C	C
			Delay	29	30	31	30	*	31	29	30	29
5th Avenue NE and I-5 Northbound Off-Ramp	TWSC	D	LOS	E	*	*	*	*	*	E	*	E
			Delay	40	*	*	*	*	*	43	*	43
NE 125th Street and 15th Avenue NE	Signal	D	LOS	D	D	D	D	*	D	D	D	D
		CoS	Delay	42	43	44	43	*	44	44	43	44

145th Street Station												
N 145th Street and Aurora Avenue N	Signal	D	LOS	D	D	D	D	D	*	*	D	D
		WSDOT HSS	Delay	51	52	52	52	52	*	*	52	52
N 145th Street and Meridian Avenue N	Signal	E	LOS	E	E	E	E	E	*	*	E	E
		WSDOT non HSS	Delay	57	56	56	56	56	*	*	56	56
N 145th Street and I-5 Southbound Ramps	Signal	D	LOS	F	E	F	F	F	*	*	F	F
			Delay	82	77	93	94	91	*	*	93	95
5th Avenue NE and Park-and-Ride Driveway	TWSC	D	LOS	A	B	B	B	B	*	*	B	B
			Delay	8	13	12	11	11	*	*	11	13
5th Avenue NE and I-5 Northbound On-Ramp	Signal	D	LOS	B	C	A	C	A	*	*	C	A
			Delay	11	22	9	20	9	*	*	20	9
NE 145th Street and 5th Avenue NE	Signal	E	LOS	F	F	F	F	F	*	*	F	F
			Delay	111	97	120	122	123	*	*	120	123
5th Avenue NE and I-5 Northbound Off-Ramp	TWSC	D	LOS	D	D	D	E	E	*	*	D	D
			Delay	30	31	32	36	36	*	*	33	31
NE 145th Street and 15th Avenue NE	Signal	E	LOS	D	D	D	D	D	*	*	D	D
		WSDOT non HSS	Delay	45	47	48	47	47	*	*	47	47

155th Street Station												
N 155th Street and Aurora Avenue N	Signal	D	LOS	D	*	*	*	*	D	D	*	*
		WSDOT HSS	Delay	45	*	*	*	*	43	43	*	*
N 155th Street and Meridian Avenue N	Signal	D	LOS	D	*	*	*	*	E	E	*	*
		Shorline	Delay	52	*	*	*	*	64	64	*	*
NE 155th Street and 5th Avenue NE	Signal	D	LOS	B	*	*	*	*	B	B	*	*
		Shorline	Delay	11	*	*	*	*	13	13	*	*
NE 155th Street and 15th Avenue NE	Signal	D	LOS	B	*	*	*	*	C	C	*	*
		Shorline	Delay	19	*	*	*	*	21	21	*	*

185th Street Station												
N 185th Street and Aurora Avenue N	Signal	D	LOS	F	F	F	F	F	F	F	F	F
		WSDOT HSS	Delay	98	94	94	94	94	94	94	94	94
N 185th Street and Meridian Avenue N	Signal	D	LOS	D	E	E	E	E	E	E	E	E
		Shorline	Delay	51	63	63	63	63	60	63	60	63
NE 185th Street and 10th Avenue NE	Signal	D	LOS	A	B	B	B	B	B	B	B	B
		Shorline	Delay	9	11	11	11	11	11	11	11	11
N 175th Street and I-5 Southbound Ramps	Signal	D	LOS	D	D	D	D	D	D	D	D	D
		WSDOT HSS	Delay	47	47	47	47	47	47	47	47	47
NE 175th Street and I-5 Northbound Ramps	Signal	D	LOS	D	D	D	D	D	D	D	D	D
		WSDOT HSS	Delay	49	49	49	49	49	49	49	49	49

Segment B	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	B1	B2A	B4
Mountlake Terrace Station									
236th Street SW and I-5 Southbound CD On-Ramp	TWSC	D	LOS	A	B	B	B	B	B
		WSDOT HSS	Delay	9	11	11	11	11	11
236th Street SW and I-5 Northbound Off-Ramp/Park-and-Ride Driveway	Signal	D	LOS	C	C	D	C	C	C
		WSDOT HSS	Delay	26	32	45	32	32	33
236th Street SW and Transit Center Driveway (out)	Signal	E	LOS	*	D	D	D	D	*
		MLT unsig	Delay	*	31	34	31	31	*
236th Street SW and 56th Avenue W	Signal	D	LOS	D	D	D	D	D	D
		MLT sig	Delay	37	41	46	41	41	40

220th Street Station									
220th Street SW and SR 99	Signal	E	LOS	E	*	E	*	E	*
		WSDOT non HSS	Delay	60	*	60	*	60	*
220th Street SW and I-5 Southbound Ramps	Signal	D	LOS	B	*	C	*	C	*
		WSDOT HSS	Delay	17	*	20	*	20	*
220th Street SW and I-5 Northbound Ramps	Signal	D	LOS	C	*	C	*	C	*
		WSDOT HSS	Delay	32	*	31	*	31	*

Segment C	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative +	C1	C2	C3
Lynnwood Station									
196th Street SW and 50th Avenue W	Signal	E	LOS	B	B	B	B	B	B
			Delay	13	15	14	14	14	14
196th Street SW and 44th Avenue W	Signal	E	LOS	D	D	D	D	D	D
			Delay	38	39	54	39	39	39
196th Street SW and 36th Avenue West	Signal	D	LOS	C	C	C	C	C	C
			Delay	23	23	23	23	23	23
200th Street SW and 50th Avenue W	Signal	D	LOS	C	F	C	C	C	C
			Delay	27	124	31	31	31	31
200th Street SW and 48th Avenue W	Signal	D	LOS	C	E	D	D	D	D
			Delay	22	64	43	40	40	40
200th Street SW and 46th Avenue W	Signal	E	LOS	B	D	D	D	D	D
			Delay	17	42	52	54	54	54
200th Street SW and 44th Avenue W	Signal	E	LOS	E	E	F	F	F	F
			Delay	55	65	141	93	93	93
44th Avenue West and I-5 Southbound On-ramp	TWSC	D	LOS	B	A	A	A	A	A
			Delay	11	9	9	9	9	9
44th Avenue West and I-5 Northbound Off-ramp	Signal	D	LOS	B	B	C	C	C	C
			Delay	16	19	22	32	32	32

Station/Intersection PM Peak Hour Operations (LOS/Delay)

Station/Intersection PM Peak Hour Operations (LOS/Delay)

Segment A	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
130th Street Station												
N 130th Street and Aurora Avenue N	Signal	D	LOS	E	E	E	E	*	E	E	E	E
		WSDOT HSS	Delay	69	70	71	70	*	71	71	70	71
N 130th Street and Meridian Avenue N	Signal	D	LOS	B	B	B	B	*	B	B	B	B
		CoS	Delay	15	15	15	15	*	15	15	15	15
N 130th Street and Corliss Avenue N	TWSC	D	LOS	B	B	B	B	*	B	B	B	B
		CoS	Delay	10	10	10	10	*	10	10	10	10
N 130th Street and 1st Avenue NE	Signal	D	LOS	C	C	C	C	*	C	C	C	C
			Delay	26	25	26	25	*	26	25	25	25
NE 130th Street and I-5 Southbound On-Ramp	TWSC	D	LOS	A	A	A	A	*	A	A	A	A
			Delay	7	6	6	6	*	6	7	6	7
5th Avenue NE and Park-and-Ride Driveway (north)	TWSC	D	LOS	*	*	*	*	*	*	A	*	A
			Delay	*	*	*	*	*	*	4	*	4
5th Avenue NE and Park-and-Ride Driveway (south)	TWSC	D	LOS	*	*	*	*	*	*	A	*	A
			Delay	*	*	*	*	*	*	5	*	5
5th Avenue NE and Park-and-Ride Driveway (church)	TWSC	D	LOS	*	*	A	*	*	A	*	*	*
			Delay	*	*	7	*	*	7	*	*	*
NE 130th Street and 5th Avenue NE	Signal	D	LOS	C	C	C	C	*	C	C	C	C
			Delay	31	33	32	33	*	32	27	33	27
5th Avenue NE and I-5 Northbound Off-Ramp	TWSC	D	LOS	F	*	*	*	*	*	F	*	F
			Delay	>100	*	*	*	*	*	>100	*	>100
NE 127th Street and 5th Avenue NE	TWSC	D	LOS	C	B	B	B	*	B	B	B	B
		CoS	Delay	15	13	13	13	*	13	15	13	15
NE 125th Street and 5th Avenue NE	TWSC	D	LOS	C	C	C	C	*	C	C	C	C
		CoS	Delay	24	23	23	23	*	23	24	23	24
8th Avenue NE and Roosevelt Way NE	TWSC	D	LOS	D	D	D	D	*	D	D	D	D
		CoS	Delay	28	26	27	26	*	27	27	26	27
NE 127th Street and 8th Avenue NE	TWSC	D	LOS	A	A	A	A	*	A	A	A	A
		CoS	Delay	7	7	7	7	*	7	7	7	7
Roosevelt Way NE and 10th Avenue NE	Signal	D	LOS	B	B	B	B	*	B	B	B	B
		CoS	Delay	19	19	19	19	*	19	19	19	19
NE 125th Street and 15th Avenue NE	Signal	D	LOS	E	E	E	E	*	E	E	E	E
		CoS	Delay	66	67	69	67	*	69	68	67	68
145th Street Station												
N 145th Street and Aurora Avenue N	Signal	D	LOS	E	E	E	E	E	*	*	E	E
		WSDOT HSS	Delay	57	58	58	58	58	*	*	59	58
N 145th Street and Meridian Avenue N	Signal	E	LOS	B	C	C	C	C	*	*	C	C
		WSDOT non HSS	Delay	19	20	20	20	20	*	*	20	20
N 145th Street and Corliss Avenue N	TWSC	E	LOS	D	D	D	D	D	*	*	D	D
		WSDOT non HSS	Delay	26	27	27	27	27	*	*	27	27
N 145th Street and 1st Avenue NE	Signal	E	LOS	D	D	F	F	F	*	*	F	F
			Delay	36	45	>150	>150	>150	*	*	>150	>150
NE 145th Street and 3rd Avenue NE	TWSC	E	LOS	F	F	F	F	F	*	*	F	F
			Delay	>100	>100	>100	>100	>100	*	*	>100	>100
N 145th Street and I-5 Southbound Ramps	Signal	D	LOS	C	C	D	D	D	*	*	D	D
			Delay	32	27	40	38	38	*	*	44	38
5th Avenue NE and Park-and-Ride Driveway	TWSC	D	LOS	A	A	A	B	B	*	*	C	B
			Delay	8	5	9	13	11	*	*	15	10
5th Avenue NE and I-5 Northbound On-Ramp	Signal	D	LOS	B	B	A	A	A	*	*	A	A
			Delay	12	15	5	6	5	*	*	7	5
NE 145th Street and 5th Avenue NE	Signal	E	LOS	D	D	E	F	F	*	*	E	E
			Delay	44	36	64	107	102	*	*	71	74
5th Avenue NE and I-5 Northbound Off-Ramp	TWSC	D	LOS	F	F	F	F	F	*	*	F	F
			Delay	>100	>100	>100	>100	>100	*	*	>100	>100
NE 145th Street and 6th Avenue NE	TWSC	E	LOS	E/F	E/F	E/F	E/F	E/F	*	*	E/F	E/F
		WSDOT non HSS	Delay	48	57	57	57	57	*	*	49	57
NE 145th Street and 8th Avenue NE	TWSC	E	LOS	D	D	D	D	D	*	*	D	D
		WSDOT non HSS	Delay	28	31	31	30	31	*	*	31	31
NE 145th Street and 10th Avenue NE	TWSC	E	LOS	F	F	F	F	F	*	*	F	F
		WSDOT non HSS	Delay	55	60	60	60	60	*	*	60	60
NE 145th Street and 12th Avenue NE	TWSC	E	LOS	F	F	F	F	F	*	*	F	F
		WSDOT non HSS	Delay	>100	>100	>100	>100	>100	*	*	>100	>100
NE 145th Street and 15th Avenue NE	Signal	E	LOS	E	E	E	E	E	*	*	E	E
		WSDOT non HSS	Delay	61	69	69	68	69	*	*	69	69
NE 145th Street and Lake City Way NE	Signal	D	LOS	F	F	F	F	F	*	*	F	F
		WSDOT HSS	Delay	105	105	105	105	105	*	*	105	105
155th Street Station												
N 155th Street and Aurora Avenue N	Signal	D	LOS	E	*	*	*	*	E	E	*	*
		WSDOT HSS	Delay	57	*	*	*	*	60	60	*	*
N 155th Street and Ashworth Avenue N	TWSC	D	LOS	C	*	*	*	*	D	D	*	*
		Shorline	Delay	24	*	*	*	*	26	26	*	*
N 155th Street and Meridian Avenue N	Signal	D	LOS	D	*	*	*	*	E	E	*	*
		Shorline	Delay	46	*	*	*	*	74	74	*	*
N 155th Street and Corliss Avenue N	TWSC	D	LOS	C	*	*	*	*	C	C	*	*
		Shorline	Delay	16	*	*	*	*	17	17	*	*
N 155th Street and 1st Avenue NE	TWSC	D	LOS	F	*	*	*	*	F	F	*	*
		Shorline	Delay	53	*	*	*	*	76	76	*	*
NE 155th Street and Park-and-Ride Driveway	TWSC	D	LOS	*	*	*	*	*	C	C	*	*
		Shorline	Delay	*	*	*	*	*	19	19	*	*
NE 155th Street and 3rd Avenue NE	TWSC	D	LOS	B	*	*	*	*	C	C	*	*
		Shorline	Delay	13	*	*	*	*	23	23	*	*
NE 155th Street and 4th Avenue NE	TWSC	D	LOS	B	*	*	*	*	C	C	*	*
		Shorline	Delay	14	*	*	*	*	16	16	*	*
NE 155th Street and 5th Avenue NE	Signal	D	LOS	B	*	*	*	*	B	B	*	*
		Shorline	Delay	17	*	*	*	*	19	19	*	*
NE 155th Street and 6th Avenue NE	TWSC	D	LOS	C	*	*	*	*	D	D	*	*
		Shorline	Delay	24	*	*	*	*	29	29	*	*
NE 155th Street and 8th Avenue NE	TWSC	D	LOS	E	*	*	*	*	F	F	*	*
		Shorline	Delay	41	*	*	*	*	62	62	*	*
NE 155th Street and 10th Avenue NE	TWSC	D	LOS	D	*	*	*	*	D	D	*	*
		Shorline	Delay	28	*	*	*	*	32	32	*	*
NE 155th Street and 12th Avenue NE	TWSC	D	LOS	C	*	*	*	*	D	D	*	*
		Shorline	Delay	24	*	*	*	*	27	27	*	*
NE 155th Street and 15th Avenue NE	Signal	D	LOS	E	*	*	*	*	F	F	*	*
		Shorline	Delay	79	*	*	*	*	84	84	*	*
NE 159th Street and 1st Avenue NE	TWSC	D	LOS	A	*	*	*	*	A	A	*	*
		Shorline	Delay	9	*	*	*	*	9	9	*	*
NE 161st Street and 1st Avenue NE	TWSC	D	LOS	A	*	*	*	*	A	A	*	*
		Shorline	Delay	9	*	*	*	*	8	8	*	*
NE 165th Street and 5th Avenue NE	AWSC	D	LOS	F	*	*	*	*	F	F	*	*
		Shorline	Delay	60	*	*	*	*	67	67	*	*

185th Street Station

N 185th Street and Aurora Avenue N	Signal	D	LOS	E	E	E	E	E	E	E	E	E
		WSDOT HSS	Delay	77	79	79	79	79	78	79	78	79
N 185th Street and Meridian Avenue N	Signal	D	LOS	D	E	E	E	E	E	E	E	E
		Shorline	Delay	55	67	67	67	67	67	67	67	67
N 185th Street and Corliss Avenue N	TWSC	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	13	14	14	14	14	14	14	14	14
N 185th Street and 1st Avenue NE	Signal	D	LOS	C	C	C	C	C	C	C	C	C
		Shorline	Delay	20	35	35	35	35	29	35	29	35
NE 185th Street and 2nd Avenue NE	TWSC	D	LOS	C	E	E	E	E	E	E	E	E
		Shorline	Delay	24	40	40	40	40	35	40	35	40
NE 185th Street and 3rd Avenue NE	TWSC	D	LOS	C	D	D	D	D	C	D	C	D
		Shorline	Delay	19	25	25	25	25	24	25	24	25
5th Avenue NE and Park-and-Ride Driveway	TWSC	D	LOS	*	B	B	B	*	*	*	*	*
		Shorline	Delay	*	12	12	12	*	*	*	*	*
NE 185th Street and 5th Avenue NE	TWSC	D	LOS	C	C	C	C	C	D	C	D	C
		Shorline	Delay	20	18	18	18	19	34	19	34	19
NE 185th Street and 7th Avenue NE	P and P+ Signal All Others TWSC	D	LOS	D	A	A	D	D	F	D	F	D
		Shorline	Delay	26	10	10	34	34	>100	34	>100	34
8th Avenue NE and Transit Center Driveway (in)	TWSC	D	LOS	*	A	A	A	A	A	A	A	A
		Shorline	Delay	*	5	5	5	3	3	3	3	3
8th Avenue NE and Park-and-Ride Driveway (north)	TWSC	D	LOS	*	*	*	*	A	A	A	A	A
		Shorline	Delay	*	*	*	*	9	9	9	9	9
8th Avenue NE and Park-and-Ride Driveway (south)/Transit Center Driveway (out)	TWSC	D	LOS	*	*	*	*	A	B	A	B	A
		Shorline	Delay	*	*	*	*	9	10	9	10	9
NE 185th Street and 8th Avenue NE	TWSC	D	LOS	C	C	C	C	E	D	E	D	E
		Shorline	Delay	19	15	15	25	43	33	43	33	43
NE 185th Street and east Park-and-Ride Driveway (south)	TWSC	D	LOS	*	*	*	*	*	B	*	B	*
		Shorline	Delay	*	*	*	*	*	13	*	13	*
NE 185th Street and 9th Avenue NE	TWSC	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	14	15	15	15	15	15	15	15	15
10th Avenue NE and east Park-and-Ride Driveway (north)	TWSC	D	LOS	*	*	*	*	*	A	*	A	*
		Shorline	Delay	*	*	*	*	*	10	*	10	*
NE 185th Street and 10th Avenue NE	AWSC	D	LOS	C	C	C	C	C	C	C	C	C
		Shorline	Delay	16	20	20	20	20	19	20	19	20
NE Perkins Way and 15th Avenue NE	Signal	D	LOS	C	C	C	C	C	C	C	C	C
		Shorline	Delay	25	27	27	27	26	27	26	27	26
N 180th Street and Meridian Avenue N	TWSC	D	LOS	D	D	D	D	D	D	D	D	D
		Shorline	Delay	27	28	28	28	28	28	28	28	28
NE 180th Street and 5th Avenue NE	TWSC	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	12	13	13	13	13	13	13	13	13
NE 180th Street and 10th Avenue NE	AWSC	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	10	11	11	11	11	11	11	11	11
NE 180th Street and 15th Avenue NE	Signal	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	12	14	14	14	11	14	11	14	11
N 175th Street and Aurora Avenue N	Signal	D	LOS	D	D	D	D	D	D	D	D	D
		WSDOT HSS	Delay	55	55	55	55	52	55	52	55	52
N 175th Street and Meridian Avenue N	Signal	D	LOS	E	E	E	E	E	E	E	E	E
		Shorline	Delay	77	78	78	78	78	78	78	78	78
N 175th Street and I-5 Southbound Ramps	Signal	D	LOS	C	C	C	C	C	C	C	C	C
		WSDOT HSS	Delay	29	31	31	31	31	31	31	31	31
NE 175th Street and I-5 Northbound Ramps	Signal	D	LOS	E	E	E	E	E	E	E	E	E
		WSDOT HSS	Delay	57	61	61	61	61	61	61	61	61
NE 175th Street and 5th Avenue NE	Signal	D	LOS	B	B	B	B	B	B	B	B	B
		Shorline	Delay	19	19	19	19	19	19	19	19	19

Segment B	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	B1 + Option	B1	B2A	B4
Mountlake Terrace Station									
Lakeview Drive and 65th Place W	TWSC	E	LOS	B	C	C	C	C	C
		MLT unsig	Delay	14	15	16	15	15	15
Lakeview Drive and 64th Avenue W	TWSC	E	LOS	B	B	B	B	B	B
		MLT unsig	Delay	14	14	13	14	14	14
236th Street SW and I-5 Southbound CD On-Ramp	TWSC	D	LOS	A	A	A	A	A	A
		WSDOT HSS	Delay	8	8	9	8	8	8
236th Street SW and I-5 Northbound Off-Ramp/Park-and-Ride Driveway	Signal	D	LOS	C	C	C	C	C	C
		WSDOT HSS	Delay	22	25	27	25	25	25
236th Street SW and Transit Center Driveway (out)	Signal	E	LOS	*	D	D	D	D	*
		MLT unsig	Delay	*	30	32	30	30	*
236th Street SW and 58th Avenue W	Signal	E	LOS	A	B	B	B	B	B
		MLT unsig	Delay	9	13	16	13	13	13
236th Street SW and 56th Avenue W	Signal	D	LOS	D	D	D	D	D	D
		MLT sig	Delay	37	51	53	51	51	50
220th Street Station									
220th Street SW and SR 99	Signal	E	LOS	F	F	F	F	F	*
		WSDOT non HSS	Delay	88	88	88	88	88	*
220th Street SW and 70th Avenue W	Signal	E	LOS	C	*	C	*	*	*
		MLT sig excp	Delay	22	*	22	*	*	*
220th Street SW and 66th Avenue W	Signal	E	LOS	D	*	D	*	*	*
		MLT sig excp	Delay	42	*	43	*	*	*
220th Street SW and 64th Avenue W	Signal	E	LOS	C	*	C	*	*	*
		MLT sig excp	Delay	29	*	28	*	*	*
222nd Street SW and 64th Avenue W	AWSC	E	LOS	A	*	A	*	*	A
		MLT unsig	Delay	8	*	8	*	*	8
220th Street SW and Park-and-Ride Driveway	Signal	E	LOS	*	*	A	*	*	A
		MLT sig excp	Delay	*	*	7	*	*	7
220th Street SW and I-5 Southbound Ramps	Signal	D	LOS	B	*	B	*	*	B
		WSDOT HSS	Delay	11	*	16	*	*	16
220th Street SW and I-5 Northbound Ramps	Signal	D	LOS	C	*	C	*	*	C
		WSDOT HSS	Delay	22	*	22	*	*	22
220th Street SW and 58th Avenue W	Signal	E	LOS	A	*	A	*	*	A
		MLT unsig	Delay	6	*	7	*	*	7
220th Street SW and 56th Avenue W	Signal	E	LOS	C	*	C	*	*	C
		MLT sig excp	Delay	28	*	28	*	*	28
220th Street SW and 55th Avenue W	TWSC	E	LOS	B	*	B	*	*	B
		MLT unsig	Delay	11	*	11	*	*	11
220th Street SW and 54th Avenue W	TWSC	E	LOS	B	*	B	*	*	B
		MLT unsig	Delay	14	*	14	*	*	14
220th Street SW and 53rd Avenue W	TWSC	E	LOS	B	*	B	*	*	B
		MLT unsig	Delay	12	*	12	*	*	12
220th Street SW and 52nd Avenue W	Signal	E	LOS	C	*	C	*	*	C
		MLT unsig	Delay	20	*	21	*	*	21

Segment C	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative +	C1	C2	C3
Lynnwood Station									
196th Street SW and 52nd Avenue W	Signal	E	LOS	C	C	C	C	C	C
		WSDOT non HSS	Delay	35	32	32	32	32	32
196th Street SW and 50th Avenue W	TWSC	E	LOS	F	F	F	F	F	F
			Delay	>100	94	97	78	78	78
196th Street SW and 48th Avenue W	Signal	E	LOS	E	E	E	E	E	E
			Delay	59	68	71	68	68	68
196th Street SW and 44th Avenue W	Signal	E	LOS	F	F	F	F	F	F
			Delay	99	103	99	99	99	99
196th Street SW and 40th Avenue W	Signal	E	LOS	E	E	E	E	E	E
			Delay	72	67	70	72	72	72
196th Street SW and 36th Avenue West	Signal	D	LOS	F	E	E	E	E	E
			Delay	83	63	79	72	72	72
196th Street SW and Poplar Way	Signal	E	LOS	D	C	D	D	D	D
			Delay	35	28	37	40	40	40
Alderwood Mall Parkway/I-5 Northbound Ramps and Poplar Way	Signal	D	LOS	C	C	C	C	C	C
			Delay	34	33	33	34	34	34
198th Street and 44th Avenue W	TWSC	E	LOS	A	A	A	A	A	A
			Delay	1	1	1	1	1	1
198th Street and 40th Avenue W	TWSC	E	LOS	A	D	B	B	B	B
			Delay	3	26	10	11	11	11
200th Street SW and 50th Avenue W	Signal	D	LOS	D	D	E	E	E	E
			Delay	41	51	76	59	59	59
200th Street SW and 48th Avenue W	Signal	D	LOS	D	E	E	D	D	D
			Delay	40	60	67	55	55	55
200th Street SW and 46th Avenue W	Signal	E	LOS	C	C	D	D	D	D
			Delay	33	25	46	39	39	39
200th Street SW and 44th Avenue W	Signal	E	LOS	E	E	E	E	E	E
			Delay	60	55	67	62	62	62
200th Street SW and 40th Avenue W	Signal	E	LOS	A	A	A	A	A	A
			Delay	7	8	9	9	9	9
52nd Avenue W and 204th Street SW	TWSC	E	LOS	E	F	F	F	F	F
			Delay	45	53	57	53	53	53
52nd Avenue W and 208th Street SW	TWSC	E	LOS	F	F	F	F	F	F
		LW unsig non CC	Delay	>100	>100	>100	>100	>100	>100
52nd Avenue W and 212th Street SW	Signal	E	LOS	F	F	F	F	F	F
		MLT sig excp	Delay	>150	>150	>150	>150	>150	>150
46th Avenue W and Garage Driveway	AWSC	E	LOS	C	C	E	E	E	E
			Delay	18	25	41	41	41	41
44th Avenue W and I-5 Southbound On-ramp	TWSC	D	LOS	B	C	B	B	B	B
			Delay	14	22	13	13	13	13
44th Avenue W and 204th Street SW	Signal	D	LOS	A	A	A	A	A	A
			Delay	5	6	6	5	5	5
44th Avenue W and I-5 Northbound Off-ramp	Signal	D	LOS	C	C	C	C	C	C
			Delay	25	26	25	35	35	35

Station/Intersection AM Peak Hour Operations (LOS/Delay) - Mitigation Results

Station/Intersection AM Peak Hour Operations (LOS/Delay) - Mitigation Results

Segment A	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
145th Street Station												
5th Avenue NE and I-5 Northbound Off-Ramp	TWSC	D	LOS	D	D	D	D	D	*	*	D	D
			Delay	30	31	30	31	34	*	*	33	31
155th Street Station												
N 155th Street and Meridian Avenue N	Signal	D	LOS	D	*	*	*	*	C	C	*	*
		Shorline	Delay	52	*	*	*	*	27	27	*	*
185th Street Station												
N 185th Street and Meridian Avenue N	Signal	D	LOS	D	D	D	D	D	D	D	D	D
		Shorline	Delay	51	55	55	55	55	55	55	55	55

Segment C	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	C1	C2	C3
Lynnwood Station									
200th Street SW and 50th Avenue W	Signal	D	LOS	C	C	C	C	C	C
			Delay	27	28	31	31	31	31
200th Street SW and 48th Avenue W	Signal	D	LOS	C	D	D	D	D	D
			Delay	22	52	43	40	40	40
200th Street SW and 44th Avenue W	Signal	E	LOS	E	E	D	D	D	D
			Delay	55	55	49	52	49	49

Station/Intersection PM Peak Hour Operations (LOS/Delay) - Mitigation Result

Station/Intersection PM Peak Hour Operations (LOS/Delay) - Mitigation Results

Segment A	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	A1	A3	A5	A7	A10	A11
145th Street Station												
N 145th Street and 1st Avenue NE	Signal	E	LOS	D	D	D	D	D	*	*	D	D
			Delay	36	45	46	51	46	*	*	40	50
NE 145th Street and 5th Avenue NE	Signal	E	LOS	D	D	D	D	D	*	*	D	D
			Delay	44	36	37	38	37	*	*	38	38
155th Street Station												
N 155th Street and Meridian Avenue N	Signal	D	LOS	D	*	*	*	*	C	C	*	*
		Shorline	Delay	46	*	*	*	*	34	34	*	*
N 155th Street and 1st Avenue NE	TWSC	D	LOS	F	*	*	*	*	C	C	*	*
		Shorline	Delay	53	*	*	*	*	24	24	*	*
NE 155th Street and 8th Avenue NE	TWSC	D	LOS	E	*	*	*	*	C	C	*	*
		Shorline	Delay	41	*	*	*	*	18	18	*	*
NE 165th Street and 5th Avenue NE	AWSC	D	LOS	F	*	*	*	*	B	B	*	*
		Shorline	Delay	60	*	*	*	*	14	14	*	*
185th Street Station												
N 185th Street and Meridian Avenue N	Signal	D	LOS	D	D	D	D	D	D	D	D	D
		Shorline	Delay	54	54	54	54	54	54	54	54	54
NE 185th Street and 2nd Avenue NE	TWSC	D	LOS	C	C	C	C	C	C	C	C	C
		Shorline	Delay	24	17	17	17	17	17	17	17	17
NE 185th Street and 7th Avenue NE	P and P+ Signal All Others TWSC	D	LOS	D	A	A	C	C	C	C	C	C
		Shorline	Delay	26	10	10	17	17	21	17	21	17
NE 185th Street and 8th Avenue NE	TWSC	D	LOS	C	C	C	C	C	D	C	D	C
		Shorline	Delay	19	15	15	25	20	33	20	33	20
Segment C	Intersection Control	LOS Standard	LOS/Delay	No Build	Preferred Alternative	Preferred Alternative + Option	C1	C2	C3			
Lynnwood Station												
200th Street SW and 50th Avenue W	Signal	D	LOS	D	C	D	C	C	C			
			Delay	41	29	45	34	34	34			
200th Street SW and 48th Avenue W	Signal	D	LOS	D	D	D	D	D	D			
			Delay	40	47	51	52	52	52			
52nd Avenue W and 204th Street SW	TWSC	E	LOS	E	A	A	A	A	A			
			Delay	45	8	8	8	8	8			

145th Station Area AM peak hour 2035 Volumes

145th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
5th Ave NE at I-5 northbound off-ramp				
Northbound	285	305	20	7%
<i>through</i>	285	305	20	7%
Southbound	295	315	20	7%
<i>through</i>	295	315	20	7%
Eastbound	780	780	0	0%
<i>left</i>	780	780	0	0%
5th Ave NE at NE 145th Street				
Northbound	1065	1100	35	3%
<i>left</i>	360	360	0	0%
<i>through</i>	295	330	35	12%
<i>right</i>	410	410	0	0%
Southbound	660	720	60	9%
<i>left</i>	40	65	25	63%
<i>through</i>	225	235	10	4%
<i>right</i>	395	420	25	6%
Eastbound	1040	1115	75	7%
<i>left</i>	335	405	70	21%
<i>through</i>	635	635	0	0%
<i>right</i>	70	75	5	7%
Westbound	1120	1155	35	3%
<i>left</i>	0	5	5	
<i>through</i>	840	840	0	0%
<i>right</i>	280	310	30	11%
5th Ave NE at I-5 northbound on-ramp				
Northbound	910	900	-10	-1%
<i>left</i>	640	640	0	0%
<i>through</i>	270	260	-10	-4%
Southbound	700	790	90	13%
<i>through</i>	655	745	90	14%
<i>right</i>	45	45	0	0%
Eastbound	5	80	75	1500%
<i>left</i>	0	20	20	
<i>right</i>	5	60	55	1100%

145th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
5th Ave NE at PNR driveway				
Northbound	270	1045	775	287%
<i>left</i>	15	145	130	867%
<i>through</i>	255	900	645	253%
Southbound	710	805	95	13%
<i>through</i>	695	720	25	4%
<i>right</i>	15	85	70	467%
Eastbound	10	0	-10	-100%
<i>left</i>	5	0	-5	-100%
<i>right</i>	5	0	-5	-100%
I-5 sb ramps at NE 145th Street				
Southbound	725	725	0	0%
<i>left</i>	355	355	0	0%
<i>right</i>	370	370	0	0%
Eastbound	1610	1685	75	5%
<i>through</i>	685	760	75	11%
<i>right</i>	925	925	0	0%
Westbound	1595	1605	10	1%
<i>left</i>	765	765	0	0%
<i>through</i>	830	840	10	1%
Meridian Ave N at NE 145th Street				
Northbound	85	95	10	12%
<i>left</i>	5	5	0	0%
<i>through</i>	50	50	0	0%
<i>right</i>	30	40	10	33%
Southbound	525	525	0	0%
<i>left</i>	270	270	0	0%
<i>through</i>	200	200	0	0%
<i>right</i>	55	55	0	0%
Eastbound	1110	1160	50	5%
<i>left</i>	20	20	0	0%
<i>through</i>	1080	1120	40	4%
<i>right</i>	10	20	10	100%
Westbound	800	820	20	3%
<i>left</i>	30	35	5	17%
<i>through</i>	745	760	15	2%
<i>right</i>	25	25	0	0%

145th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
SR99 at NE 145th Street				
Northbound	600	605	5	1%
<i>left</i>	40	40	0	0%
<i>through</i>	380	380	0	0%
<i>right</i>	180	185	5	3%
Southbound	1825	1835	10	1%
<i>left</i>	305	315	10	3%
<i>through</i>	1445	1445	0	0%
<i>right</i>	75	75	0	0%
Eastbound	625	650	25	4%
<i>left</i>	55	55	0	0%
<i>through</i>	510	535	25	5%
<i>right</i>	60	60	0	0%
Westbound	665	685	20	3%
<i>left</i>	230	235	5	2%
<i>through</i>	310	320	10	3%
<i>right</i>	125	130	5	4%
15th Ave N at NE 145th Street				
Northbound	395	405	10	3%
<i>left</i>	105	110	5	5%
<i>through</i>	220	225	5	2%
<i>right</i>	70	70	0	0%
Southbound	900	905	5	1%
<i>left</i>	110	110	0	0%
<i>through</i>	690	695	5	1%
<i>right</i>	100	100	0	0%
Eastbound	965	990	25	3%
<i>left</i>	160	160	0	0%
<i>through</i>	695	710	15	2%
<i>right</i>	110	120	10	9%
Westbound	1150	1170	20	2%
<i>left</i>	190	190	0	0%
<i>through</i>	910	930	20	2%
<i>right</i>	50	50	0	0%

145th Station Area PM peak hour 2035 Volumes

145th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
5th Ave NE at I-5 northbound off-ramp				
Northbound	570	580	10	2%
<i>through</i>	570	580	10	2%
Southbound	220	250	30	14%
<i>through</i>	220	250	30	14%
Eastbound	1045	1045	0	0%
<i>left</i>	1045	1045	0	0%
5th Ave NE at NE 145th Street				
Northbound	1615	1625	10	1%
<i>left</i>	380	380	0	0%
<i>through</i>	660	670	10	2%
<i>right</i>	575	575	0	0%
Southbound	230	330	100	43%
<i>left</i>	40	65	25	63%
<i>through</i>	70	100	30	43%
<i>right</i>	120	165	45	38%
Eastbound	1415	1440	25	2%
<i>left</i>	460	485	25	5%
<i>through</i>	810	810	0	0%
<i>right</i>	145	145	0	0%
Westbound	1115	1140	25	2%
<i>left</i>	5	5	0	0%
<i>through</i>	755	755	0	0%
<i>right</i>	355	380	25	7%
5th Ave NE at I-5 northbound on-ramp				
Northbound	1475	1470	-5	0%
<i>left</i>	660	660	0	0%
<i>through</i>	815	810	-5	-1%
Southbound	225	235	10	4%
<i>through</i>	215	225	10	5%
<i>right</i>	10	10	0	0%
Eastbound	10	225	215	2150%
<i>left</i>	0	100	100	
<i>right</i>	10	125	115	1150%

145th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
5th Ave NE at PNR driveway				
Northbound	815	1535	720	88%
<i>left</i>	15	65	50	333%
<i>through</i>	800	1470	670	84%
Southbound	205	350	145	71%
<i>through</i>	200	330	130	65%
<i>right</i>	5	20	15	300%
Eastbound	45	0	-45	-100%
<i>left</i>	20	0	-20	-100%
<i>right</i>	25	0	-25	-100%
I-5 sb ramps at NE 145th Street				
Southbound	975	975	0	0%
<i>left</i>	475	475	0	0%
<i>right</i>	500	500	0	0%
Eastbound	1205	1235	30	2%
<i>through</i>	935	965	30	3%
<i>right</i>	270	270	0	0%
Westbound	1250	1300	50	4%
<i>left</i>	450	450	0	0%
<i>through</i>	800	850	50	6%
Meridian Ave N at NE 145th Street				
Northbound	310	315	5	2%
<i>left</i>	20	20	0	0%
<i>through</i>	255	255	0	0%
<i>right</i>	35	40	5	14%
Southbound	240	240	0	0%
<i>left</i>	55	55	0	0%
<i>through</i>	125	125	0	0%
<i>right</i>	60	60	0	0%
Eastbound	985	1000	15	2%
<i>left</i>	30	30	0	0%
<i>through</i>	935	950	15	2%
<i>right</i>	20	20	0	0%
Westbound	1120	1180	60	5%
<i>left</i>	40	45	5	13%
<i>through</i>	1060	1115	55	5%
<i>right</i>	20	20	0	0%

145th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
SR99 at NE 145th Street				
Northbound	1770	1775	5	0%
<i>left</i>	75	75	0	0%
<i>through</i>	1390	1390	0	0%
<i>right</i>	305	310	5	2%
Southbound	1330	1335	5	0%
<i>left</i>	215	220	5	2%
<i>through</i>	1020	1020	0	0%
<i>right</i>	95	95	0	0%
Eastbound	655	665	10	2%
<i>left</i>	150	150	0	0%
<i>through</i>	410	420	10	2%
<i>right</i>	95	95	0	0%
Westbound	1035	1090	55	5%
<i>left</i>	195	200	5	3%
<i>through</i>	605	640	35	6%
<i>right</i>	235	250	15	6%
15th Ave N at NE 145th Street				
Northbound	1060	1070	10	1%
<i>left</i>	175	180	5	3%
<i>through</i>	755	760	5	1%
<i>right</i>	130	130	0	0%
Southbound	620	630	10	2%
<i>left</i>	150	150	0	0%
<i>through</i>	365	370	5	1%
<i>right</i>	105	110	5	5%
Eastbound	1460	1490	30	2%
<i>left</i>	180	185	5	3%
<i>through</i>	1080	1100	20	2%
<i>right</i>	200	205	5	3%
Westbound	1065	1085	20	2%
<i>left</i>	105	105	0	0%
<i>through</i>	810	830	20	2%
<i>right</i>	150	150	0	0%

145th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
Lake City Way NE at NE 145th Street				
Northbound	2010	2015	5	0%
<i>left</i>	145	150	5	3%
<i>through</i>	1845	1845	0	0%
<i>right</i>	20	20	0	0%
Southbound	1890	1895	5	0%
<i>left</i>	60	60	0	0%
<i>through</i>	1270	1270	0	0%
<i>right</i>	560	565	5	1%
Eastbound	1190	1205	15	1%
<i>left</i>	935	945	10	1%
<i>through</i>	90	90	0	0%
<i>right</i>	165	170	5	3%
Westbound	260	265	5	2%
<i>left</i>	50	50	0	0%
<i>through</i>	80	85	5	6%
<i>right</i>	130	130	0	0%
1th Ave N at NE 145th Street				
Northbound	510	515	5	1%
<i>left</i>	75	75	0	0%
<i>through</i>	255	255	0	0%
<i>right</i>	180	185	5	3%
Southbound	130	135	5	4%
<i>left</i>	35	40	5	14%
<i>through</i>	80	80	0	0%
<i>right</i>	15	15	0	0%
Eastbound	1010	1035	25	2%
<i>left</i>	0	0	0	0%
<i>through</i>	985	1010	25	3%
<i>right</i>	25	25	0	0%
Westbound	1305	1375	70	5%
<i>left</i>	145	155	10	7%
<i>through</i>	1120	1180	60	5%
<i>right</i>	40	40	0	0%

185th Station Area AM peak hour 2035 Volumes

185th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
SR99 at NE 185th Street				
Northbound	730	750	20	3%
<i>left</i>	325	325	0	0%
<i>through</i>	365	365	0	0%
<i>right</i>	40	60	20	50%
Southbound	1555	1570	15	1%
<i>left</i>	45	60	15	33%
<i>through</i>	1410	1410	0	0%
<i>right</i>	100	100	0	0%
Eastbound	880	915	35	4%
<i>left</i>	75	75	0	0%
<i>through</i>	310	345	35	11%
<i>right</i>	495	495	0	0%
Westbound	360	390	30	8%
<i>left</i>	140	145	5	4%
<i>through</i>	170	185	15	9%
<i>right</i>	50	60	10	20%
South eastbound Firlands Way	285	310	25	9%
<i>right</i>	5	5	0	0%
Meridian Ave N at NE 185th Street				
Northbound	280	305	25	9%
<i>left</i>	65	65	0	0%
<i>through</i>	160	160	0	0%
<i>right</i>	55	80	25	45%
Southbound	765	775	10	1%
<i>left</i>	65	75	10	15%
<i>through</i>	670	670	0	0%
<i>right</i>	30	30	0	0%
Eastbound	465	535	70	15%
<i>left</i>	30	30	0	0%
<i>through</i>	195	265	70	36%
<i>right</i>	240	240	0	0%
Westbound	510	560	50	10%
<i>left</i>	180	190	10	6%
<i>through</i>	280	310	30	11%
<i>right</i>	50	60	10	20%

185th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
10th Ave NE at NE 185th Street				
Northbound	150	180	30	20%
<i>left</i>	105	135	30	29%
<i>through</i>	40	40	0	0%
<i>right</i>	5	5	0	0%
Southbound	245	265	20	8%
<i>left</i>	10	10	0	0%
<i>through</i>	85	85	0	0%
<i>right</i>	150	170	20	13%
Eastbound	250	280	30	12%
<i>left</i>	65	75	10	15%
<i>through</i>	30	30	0	0%
<i>right</i>	155	175	20	13%
Westbound	25	30	5	20%
<i>left</i>	10	10	0	0%
<i>through</i>	10	15	5	50%
<i>right</i>	5	5	0	0%

185th Station Area PM peak hour 2035 Volumes

185th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
SR99 at NE 185th Street				
Northbound	1945	1950	5	0%
left	565	565	0	0%
through	1335	1335	0	0%
right	45	50	5	11%
Southbound	1160	1170	10	1%
left	75	85	10	13%
through	950	950	0	0%
right	135	135	0	0%
Eastbound	895	905	10	1%
left	215	215	0	0%
through	350	360	10	3%
right	330	330	0	0%
Westbound	605	670	65	11%
left	180	200	20	11%
through	285	310	25	9%
right	140	160	20	14%
South eastbound Firlands Way	925	935	10	1%
right	20	20	0	0%
Meridian Ave NE at NE 185th Street				
Northbound	905	915	10	1%
left	175	175	0	0%
through	625	625	0	0%
right	105	115	10	10%
Southbound	420	430	10	2%
left	110	120	10	9%
through	270	270	0	0%
right	40	40	0	0%
Eastbound	500	525	25	5%
left	85	85	0	0%
through	315	340	25	8%
right	100	100	0	0%
Westbound	515	625	110	21%
left	135	165	30	22%
through	325	390	65	20%
right	55	70	15	27%

185th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
Corliss Ave NE at NE 185th Street				
Northbound	25	25	0	0%
<i>left</i>	10	10	0	0%
<i>through</i>	5	5	0	0%
<i>right</i>	10	10	0	0%
Southbound	15	15	0	0%
<i>left</i>	5	5	0	0%
<i>through</i>	5	5	0	0%
<i>right</i>	5	5	0	0%
Eastbound	525	565	40	8%
<i>left</i>	5	5	0	0%
<i>through</i>	500	540	40	8%
<i>right</i>	20	20	0	0%
Westbound	570	675	105	18%
<i>left</i>	10	10	0	0%
<i>through</i>	555	660	105	19%
<i>right</i>	5	5	0	0%
1st Ave NE at NE 185th Street				
Northbound	25	25	0	0%
<i>left</i>	5	5	0	0%
<i>through</i>	15	15	0	0%
<i>right</i>	5	5	0	0%
Southbound	210	215	5	2%
<i>left</i>	75	80	5	7%
<i>through</i>	15	15	0	0%
<i>right</i>	120	120	0	0%
Eastbound	580	630	50	9%
<i>left</i>	170	170	0	0%
<i>through</i>	400	450	50	13%
<i>right</i>	10	10	0	0%
Westbound	525	660	135	26%
<i>left</i>	10	15	5	50%
<i>through</i>	385	490	105	27%
<i>right</i>	130	155	25	19%

185th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
2nd Ave NE at NE 185th Street				
Northbound	20	20	0	0%
left	5	5	0	0%
through	5	5	0	0%
right	10	10	0	0%
Southbound	70	75	5	7%
left	30	35	5	17%
through	0	0	0	0%
right	40	40	0	0%
Eastbound	470	525	55	12%
left	25	25	0	0%
through	430	485	55	13%
right	15	15	0	0%
Westbound	550	705	155	28%
left	10	15	5	50%
through	505	645	140	28%
right	35	45	10	29%
3rd Ave NE at NE 185th Street				
Northbound	20	25	5	25%
left	5	5	0	0%
through	5	5	0	0%
right	10	15	5	50%
Southbound	15	15	0	0%
left	5	5	0	0%
through	5	5	0	0%
right	5	5	0	0%
Eastbound	485	545	60	12%
left	5	5	0	0%
through	470	530	60	13%
right	10	10	0	0%
Westbound	555	690	135	24%
left	10	15	5	50%
through	540	670	130	24%
right	5	5	0	0%

185th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
5th Ave NE at NE 185th Street				
Southbound	90	255	165	183%
<i>left</i>	30	85	55	183%
<i>right</i>	60	170	110	183%
Eastbound	495	555	60	12%
<i>left</i>	70	90	20	29%
<i>through</i>	425	465	40	9%
Westbound	560	625	65	12%
<i>through</i>	500	540	40	8%
<i>right</i>	60	85	25	42%
7th Ave NE at NE 185th Street				
Northbound	290	305	15	5%
<i>left</i>	180	190	10	6%
<i>right</i>	110	115	5	5%
Southbound	10	55	45	450%
<i>left</i>	5	10	5	
<i>through</i>	0	5	5	
<i>right</i>	5	40	35	700%
Eastbound	465	560	95	20%
<i>left</i>	5	5	0	0%
<i>through</i>	360	440	80	22%
<i>right</i>	100	115	15	15%
Westbound	380	430	50	13%
<i>left</i>	20	20	0	0%
<i>through</i>	355	405	50	14%
<i>right</i>	5	5	0	0%
8th Ave NE at NE 185th Street				
Northbound	40	40	0	0%
<i>left</i>	25	25	0	0%
<i>through</i>	5	5	0	0%
<i>right</i>	10	10	0	0%
Southbound	35	35	0	0%
<i>left</i>	5	5	0	0%
<i>through</i>	5	5	0	0%
<i>right</i>	25	25	0	0%
Eastbound	445	545	100	22%
<i>left</i>	20	70	50	250%
<i>through</i>	405	455	50	12%
<i>right</i>	20	20	0	0%
Westbound	365	385	20	5%
<i>left</i>	5	5	0	0%
<i>through</i>	355	370	15	4%
<i>right</i>	5	10	5	100%

185th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
9th Ave NE at NE 185th Street				
Northbound	10	10	0	0%
left	5	5	0	0%
right	5	5	0	0%
Eastbound	435	485	50	11%
through	430	480	50	12%
right	5	5	0	0%
Westbound	365	390	25	7%
left	5	5	0	0%
through	360	385	25	7%
10th Ave NE at NE 185th Street				
Northbound	355	370	15	4%
left	230	245	15	7%
through	120	120	0	0%
right	5	5	0	0%
Southbound	195	205	10	5%
left	5	5	0	0%
through	70	70	0	0%
right	120	130	10	8%
Eastbound	430	480	50	12%
left	190	210	20	11%
through	20	20	0	0%
right	220	250	30	14%
Westbound	20	20	0	0%
left	5	5	0	0%
through	10	10	0	0%
right	5	5	0	0%
Meridian Ave NE at NE 175th Street				
Northbound	890	895	5	1%
left	95	95	0	0%
through	530	535	5	1%
right	265	265	0	0%
Southbound	525	530	5	1%
left	230	230	0	0%
through	255	260	5	2%
right	40	40	0	0%
Eastbound	1005	1005	0	0%
left	75	75	0	0%
through	860	860	0	0%
right	70	70	0	0%
Westbound	1372	1373	1	0%
left	170	170	0	0%
through	862	863	1	0%
right	340	340	0	0%

220th Station Area AM peak hour 2035 Volumes

220th Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
SR99 at 220th SW Street				
Northbound	930	940	10	1%
left	95	95	0	0%
through	700	705	5	1%
right	135	140	5	4%
Southbound	1600	1610	10	1%
left	200	205	5	3%
through	1275	1280	5	0%
right	125	125	0	0%
Eastbound	685	700	15	2%
left	95	95	0	0%
through	545	560	15	3%
right	45	45	0	0%
Westbound	865	885	20	2%
left	200	205	5	3%
through	470	485	15	3%
right	195	195	0	0%
220th P&R DR at 220th SW Street				
Northbound	na	30	na	na
left	na	15	na	na
through	na	15	na	na
Eastbound	na	1430	na	na
through	na	1390	na	na
right	na	40	na	na
Westbound	na	1505	na	na
left	na	50	na	na
through	na	1455	na	na
I-5 SB Ramps at 220th SW Street				
Southbound	775	805	30	4%
left	250	250	0	0%
through	5	5	0	0%
right	520	550	30	6%
Eastbound	1385	1405	20	1%
through	810	825	15	2%
right	575	580	5	1%
Westbound	1110	1140	30	3%
left	185	185	0	0%
through	925	955	30	3%
I-5 NB Ramps at 220th SW Street				
Northbound	750	760	10	1%
left	675	685	10	1%
right	75	75	0	0%
Eastbound	1060	1075	15	1%
left	665	670	5	1%
through	395	405	10	3%
Westbound	680	705	25	4%
through	435	460	25	6%
right	245	245	0	0%

220th Station Area PM peak hour 2035 Volumes

220th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 with station - Intersection Volumes	2035 with station - Project Generated Trips	2035 with station - Percent Increase Over No build
SR99 at 220th SW Street				
Northbound	1855	1910	55	3%
left	190	195	5	3%
through	1540	1585	45	3%
right	125	130	5	4%
Southbound	1625	1630	5	0%
left	230	230	0	0%
through	1265	1270	5	0%
right	130	130	0	0%
Eastbound	785	800	15	2%
left	130	130	0	0%
through	590	605	15	3%
right	65	65	0	0%
Westbound	1060	1075	15	1%
left	265	270	5	2%
through	585	595	10	2%
right	210	210	0	0%
70th Ave W at 220th SW Street				
Northbound	145	145	0	0%
left	55	55	0	0%
through	15	15	0	0%
right	75	75	0	0%
Southbound	375	375	0	0%
left	240	240	0	0%
through	20	20	0	0%
right	115	115	0	0%
Eastbound	890	905	15	2%
left	5	5	0	0%
through	865	880	15	2%
right	20	20	0	0%
Westbound	1060	1085	25	2%
left	25	30	5	20%
through	995	1015	20	2%
right	40	40	0	0%
66th Ave W at 220th SW Street				
Northbound	375	375	0	0%
left	105	105	0	0%
through	195	195	0	0%
right	75	75	0	0%
Southbound	1005	1010	5	0%
left	600	605	5	1%
through	330	330	0	0%
right	75	75	0	0%
Eastbound	1175	1190	15	1%
left	100	100	0	0%
through	985	1000	15	2%
right	90	90	0	0%
Westbound	1310	1340	30	2%
left	100	100	0	0%
through	880	905	25	3%
right	330	335	5	2%

220th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 with station - Intersection Volumes	2035 with station - Project Generated Trips	2035 with station - Percent Increase Over No build
64th Ave W at 220th SW Street				
Northbound	155	155	0	0%
left	25	25	0	0%
through	35	35	0	0%
right	95	95	0	0%
Southbound	325	325	0	0%
left	225	225	0	0%
through	55	55	0	0%
right	45	45	0	0%
Eastbound	1605	1625	20	1%
left	30	30	0	0%
through	1535	1555	20	1%
right	40	40	0	0%
Westbound	1620	1660	40	2%
left	175	180	5	3%
through	1365	1400	35	3%
right	80	80	0	0%
220th P&R DR at 220th SW Street				
Northbound	na	85	na	na
left	na	40	na	na
through	na	45	na	na
Eastbound	na	1780	na	na
through	na	1765	na	na
right	na	15	na	na
Westbound	na	1480	na	na
left	na	15	na	na
through	na	1465	na	na
I-5 SB Ramps at 220th SW Street				
Southbound	1030	1040	10	1%
left	325	325	0	0%
right	705	715	10	1%
Eastbound	1725	1780	55	3%
through	1370	1415	45	3%
right	355	365	10	3%
Westbound	700	710	10	1%
left	95	95	0	0%
through	605	615	10	2%
I-5 NB Ramps at 220th SW Street				
Northbound	495	495	0	0%
left	380	380	0	0%
right	115	115	0	0%
Eastbound	1695	1740	45	3%
left	1155	1180	25	2%
through	540	560	20	4%
Westbound	635	640	5	1%
through	320	325	5	2%
right	315	315	0	0%

220th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 with station - Intersection Volumes	2035 with station - Project Generated Trips	2035 with station - Percent Increase Over No build
58th Ave W at 220th SW Street				
Northbound	140	140	0	0%
left	100	100	0	0%
through	5	5	0	0%
right	35	35	0	0%
Southbound	45	45	0	0%
left	20	20	0	0%
through	5	5	0	0%
right	20	20	0	0%
Eastbound	860	880	20	2%
left	30	30	0	0%
through	725	745	20	3%
right	105	105	0	0%
Westbound	600	605	5	1%
left	40	40	0	0%
through	545	550	5	1%
right	15	15	0	0%
56th Ave W at 220th SW Street				
Northbound	680	680	0	0%
left	330	330	0	0%
through	35	35	0	0%
right	315	315	0	0%
Southbound	35	35	0	0%
left	5	5	0	0%
through	20	20	0	0%
right	10	10	0	0%
Eastbound	540	560	20	4%
left	20	20	0	0%
through	270	275	5	2%
right	250	265	15	6%
Westbound	415	415	0	0%
left	205	205	0	0%
through	205	205	0	0%
right	5	5	0	0%
54th Ave W at 220th SW Street				
Northbound	20	20	0	0%
left	10	10	0	0%
through	5	5	0	0%
right	5	5	0	0%
Southbound	20	20	0	0%
left	5	5	0	0%
through	5	5	0	0%
right	10	10	0	0%
Eastbound	560	565	5	1%
left	15	15	0	0%
through	525	530	5	1%
right	20	20	0	0%
Westbound	360	360	0	0%
left	10	10	0	0%
through	345	345	0	0%
right	5	5	0	0%

220th Station Area PM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 with station - Intersection Volumes	2035 with station - Project Generated Trips	2035 with station - Percent Increase Over No build
52th Ave W at 220th SW Street				
Northbound	215	215	0	0%
<i>left</i>	80	80	0	0%
<i>through</i>	135	135	0	0%
Southbound	465	470	5	1%
<i>through</i>	125	130	5	4%
<i>right</i>	340	340	0	0%
Eastbound	460	465	5	1%
<i>left</i>	340	345	5	1%
<i>right</i>	120	120	0	0%
Westbound	15	15	0	0%
<i>left</i>	5	5	0	0%
<i>through</i>	5	5	0	0%
<i>right</i>	5	5	0	0%

Lynnwood Station Area AM peak hour 2035 Volumes

Lynnwood Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
I-5 northbound ramps at 44th Ave W			
Northbound	435	695	720
<i>through</i>	365	625	650
<i>right</i>	70	70	70
Southbound	585	895	920
<i>left</i>	35	65	70
<i>through</i>	550	830	850
Eastbound	530	585	595
<i>left</i>	420	475	485
<i>through</i>	30	30	30
<i>right</i>	80	80	80
I-5 southbound on-ramp at 44th Ave W			
Northbound	1265	1700	1745
<i>left</i>	300	300	300
<i>through</i>	965	1400	1445
Southbound	1020	1355	1390
<i>through</i>	580	890	915
<i>right</i>	440	465	475
200th St SW at 44th Ave W			
Northbound	965	1400	1445
<i>left</i>	305	415	460
<i>through</i>	485	730	730
<i>right</i>	175	255	255
Southbound	810	1070	1100
<i>left</i>	25	30	30
<i>through</i>	605	815	815
<i>right</i>	180	225	255
Eastbound	355	440	520
<i>left</i>	70	85	100
<i>through</i>	120	135	165
<i>right</i>	165	220	255
Westbound	630	760	810
<i>left</i>	250	320	320
<i>through</i>	370	430	480
<i>right</i>	10	10	10
200th St SW at 46th Ave W			
Northbound	200	200	210
<i>left</i>	90	95	110
<i>through</i>	0	0	0
<i>right</i>	105	105	100
Southbound	10	10	10
<i>left</i>	5	5	5
<i>through</i>	0	0	0
<i>right</i>	5	5	5
Eastbound	300	385	440
<i>left</i>	0	0	0
<i>through</i>	250	330	415
<i>right</i>	50	55	25
Westbound	855	1070	1195
<i>left</i>	225	235	120
<i>through</i>	625	830	1070

Lynnwood Station Area AM peak hour 2035 Volumes

Intersection/Approaches		2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
<i>right</i>		5	5	5
200th St SW at 48th Ave W				
	Northbound	120	135	350
	<i>left</i>	45	50	150
	<i>through</i>	50	55	85
	<i>right</i>	25	30	115
	Southbound	265	375	475
	<i>left</i>	55	75	75
	<i>through</i>	145	215	315
	<i>right</i>	65	85	85
	Eastbound	390	470	565
	<i>left</i>	30	40	40
	<i>through</i>	250	315	285
	<i>right</i>	110	115	240
	Westbound	620	830	1085
	<i>left</i>	80	85	360
	<i>through</i>	515	710	665
	<i>right</i>	25	35	60
200th St SW at 50th Ave W				
	Northbound	175	245	275
	<i>left</i>	15	25	25
	<i>through</i>	40	60	60
	<i>right</i>	120	160	190
	Southbound	315	450	455
	<i>left</i>	25	30	35
	<i>through</i>	215	320	320
	<i>right</i>	75	100	100
	Eastbound	290	360	420
	<i>left</i>	25	35	35
	<i>through</i>	250	300	360
	<i>right</i>	15	25	25
	Westbound	775	975	1030
	<i>left</i>	285	380	400
	<i>through</i>	470	570	605
	<i>right</i>	20	25	25

Lynnwood Station Area AM peak hour 2035 Volumes

Intersection/Approaches		2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
196th St SW at 44th Ave W				
	Northbound	440	620	635
	<i>left</i>	145	200	200
	<i>through</i>	190	275	285
	<i>right</i>	105	145	150
	Southbound	450	630	650
	<i>left</i>	75	95	95
	<i>through</i>	340	490	510
	<i>right</i>	35	45	45
	Eastbound	615	795	825
	<i>left</i>	45	60	60
	<i>through</i>	460	555	585
	<i>right</i>	110	180	180
	Westbound	1165	1445	1485
	<i>left</i>	240	325	335
	<i>through</i>	885	1070	1100
	<i>right</i>	40	50	50
196th St SW at 50th Ave W				
	Northbound	105	150	150
	<i>left</i>	50	75	75
	<i>right</i>	55	75	75
	Eastbound	755	940	975
	<i>through</i>	665	810	840
	<i>right</i>	90	130	135
	Westbound	1195	1485	1500
	<i>left</i>	200	275	275
	<i>through</i>	995	1210	1225
196th St SW at 36th Ave W				
	Southbound	325	445	455
	<i>left</i>	120	180	180
	<i>through</i>	130	145	150
	<i>right</i>	75	115	125
	Eastbound	745	950	990
	<i>left</i>	70	100	110
	<i>through</i>	640	815	830
	<i>right</i>	35	35	50
	Westbound	1710	2050	2090
	<i>left</i>	260	260	260
	<i>through</i>	1310	1585	1625
	<i>right</i>	140	205	205
196th St SW at Poplar Way				
	Northbound	190	280	285
	<i>left</i>	130	150	155
	<i>right</i>	60	130	130
	Eastbound	1155	1410	1420
	<i>through</i>	435	435	445
	<i>right</i>	720	975	975
	Westbound	750	1035	1070
	<i>through</i>	750	1035	1070
I-5 Northbound off-ramp at Poplar Way				
	Northbound	465	630	635

Lynnwood Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
<i>left</i>	<i>355</i>	<i>385</i>	<i>385</i>
<i>through</i>	<i>40</i>	<i>95</i>	<i>100</i>
<i>right</i>	<i>70</i>	<i>150</i>	<i>150</i>
Southbound	720	975	975
<i>left</i>	<i>15</i>	<i>35</i>	<i>35</i>
<i>through</i>	<i>205</i>	<i>340</i>	<i>340</i>
<i>right</i>	<i>500</i>	<i>600</i>	<i>600</i>
Eastbound	490	540	540
<i>left</i>	<i>145</i>	<i>175</i>	<i>175</i>
<i>through</i>	<i>310</i>	<i>330</i>	<i>330</i>
<i>right</i>	<i>35</i>	<i>35</i>	<i>35</i>
Westbound	160	200	200
<i>left</i>	<i>135</i>	<i>170</i>	<i>170</i>
<i>through</i>	<i>20</i>	<i>20</i>	<i>20</i>
<i>right</i>	<i>5</i>	<i>10</i>	<i>10</i>

Lynnwood Station Area PM peak hour 2035 Volumes

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
I-5 northbound ramps at 44th Ave W			
Northbound	780	1130	1145
<i>through</i>	620	955	970
<i>right</i>	160	175	175
Southbound	930	1325	1360
<i>left</i>	210	280	285
<i>through</i>	720	1045	1075
Eastbound	1040	1085	1090
<i>left</i>	770	815	820
<i>through</i>	155	155	155
<i>right</i>	115	115	115
I-5 southbound on-ramp at 44th Ave W			
Northbound	1610	2045	2070
<i>left</i>	200	200	200
<i>through</i>	1410	1845	1870
Southbound	1450	1885	1930
<i>through</i>	880	1270	1305
<i>right</i>	570	615	625
200th St SW at 44th Ave W			
Northbound	1410	1845	1870
<i>left</i>	270	350	375
<i>through</i>	820	1085	1085
<i>right</i>	320	410	410
Southbound	910	1185	1195
<i>left</i>	70	85	85
<i>through</i>	735	975	975
<i>right</i>	105	125	135
Eastbound	950	1150	1265
<i>left</i>	220	265	290
<i>through</i>	410	475	520
<i>right</i>	320	410	455
Westbound	745	900	930
<i>left</i>	395	500	500
<i>through</i>	290	330	360
<i>right</i>	60	70	70

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
200th St SW at 46th Ave W			
Northbound	500	530	360
<i>left</i>	155	165	125
<i>through</i>	5	5	5
<i>right</i>	340	360	230
Southbound	15	20	20
<i>left</i>	10	15	15
<i>through</i>	0	0	0
<i>right</i>	5	5	5
Eastbound	650	830	1075
<i>left</i>	5	5	5
<i>through</i>	600	775	1020
<i>right</i>	45	50	50
Westbound	645	805	870
<i>left</i>	115	120	75
<i>through</i>	525	675	785
<i>right</i>	5	10	10
200th St SW at 48th Ave W			
Northbound	300	320	880
<i>left</i>	125	130	355
<i>through</i>	150	160	250
<i>right</i>	25	30	275
Southbound	230	300	355
<i>left</i>	70	90	90
<i>through</i>	50	70	125
<i>right</i>	110	140	140
Eastbound	715	870	940
<i>left</i>	95	120	120
<i>through</i>	550	660	670
<i>right</i>	70	90	150
Westbound	685	845	925
<i>left</i>	20	25	215
<i>through</i>	550	670	550
<i>right</i>	115	150	160
200th St SW at 50th Ave W			
Northbound	400	525	540
<i>left</i>	40	55	55
<i>through</i>	120	165	165
<i>right</i>	240	305	320
Southbound	180	235	240
<i>left</i>	35	40	45
<i>through</i>	95	130	130
<i>right</i>	50	65	65
Eastbound	490	590	630
<i>left</i>	40	50	50
<i>through</i>	430	515	555
<i>right</i>	20	25	25
Westbound	710	860	970
<i>left</i>	150	190	215
<i>through</i>	510	610	690
<i>right</i>	50	60	65

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
196th St SW at 44th Ave W			
Northbound	1125	1460	1485
<i>left</i>	240	305	305
<i>through</i>	630	830	845
<i>right</i>	255	325	335
Southbound	725	955	960
<i>left</i>	165	205	205
<i>through</i>	505	680	685
<i>right</i>	55	70	70
Eastbound	1210	1460	1485
<i>left</i>	105	130	130
<i>through</i>	930	1110	1135
<i>right</i>	175	220	220
Westbound	1200	1440	1470
<i>left</i>	245	310	315
<i>through</i>	855	1005	1030
<i>right</i>	100	125	125
196th St SW at 50th Ave W			
Northbound	240	310	315
<i>left</i>	30	40	45
<i>right</i>	210	270	270
Eastbound	1285	1555	1585
<i>through</i>	1230	1480	1505
<i>right</i>	55	75	80
Westbound	1185	1435	1475
<i>left</i>	90	115	115
<i>through</i>	1095	1320	1360
196th St SW at 36th Ave W			
Southbound	735	945	955
<i>left</i>	325	445	445
<i>through</i>	260	295	300
<i>right</i>	150	205	210
Eastbound	1630	1985	2020
<i>left</i>	215	280	285
<i>through</i>	1345	1635	1665
<i>right</i>	70	70	70
Westbound	2150	2515	2545
<i>left</i>	400	410	410
<i>through</i>	1420	1665	1695
<i>right</i>	330	440	440
196th St SW at Poplar Way			
Northbound	315	420	420
<i>left</i>	275	325	325
<i>right</i>	40	95	95
Eastbound	2280	2745	2775
<i>through</i>	1000	1135	1155
<i>right</i>	1280	1610	1620
Westbound	795	1015	1045
<i>through</i>	795	1015	1045

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
I-5 Northbound off-ramp at Poplar Way			
Northbound	635	805	805
<i>left</i>	325	325	325
<i>through</i>	110	160	160
<i>right</i>	200	320	320
Southbound	1280	1610	1620
<i>left</i>	15	105	105
<i>through</i>	310	480	490
<i>right</i>	955	1025	1025
Eastbound	740	775	775
<i>left</i>	185	185	185
<i>through</i>	545	580	580
<i>right</i>	10	10	10
Westbound	195	250	250
<i>left</i>	155	155	155
<i>through</i>	20	20	20
<i>right</i>	20	75	75
196th St SW at 48th Ave W			
Northbound	405	525	625
<i>left</i>	105	130	160
<i>through</i>	225	300	355
<i>right</i>	75	95	110
Southbound	240	310	340
<i>left</i>	60	75	75
<i>through</i>	110	145	175
<i>right</i>	70	90	90
Eastbound	1355	1640	1665
<i>left</i>	160	200	200
<i>through</i>	1155	1390	1400
<i>right</i>	40	50	65
Westbound	1080	1305	1330
<i>left</i>	95	120	135
<i>through</i>	960	1155	1165
<i>right</i>	25	30	30

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
196th St SW at 40th Ave W			
Northbound	325	420	435
<i>left</i>	40	55	55
<i>through</i>	65	90	95
<i>right</i>	220	275	285
Southbound	290	375	375
<i>left</i>	200	250	250
<i>through</i>	60	85	85
<i>right</i>	30	40	40
Eastbound	1300	1585	1620
<i>left</i>	40	55	65
<i>through</i>	1210	1460	1485
<i>right</i>	50	70	70
Westbound	1390	1675	1710
<i>left</i>	155	190	195
<i>through</i>	1150	1380	1410
<i>right</i>	85	105	105
200th St SW at 40th Ave W			
Southbound	280	365	370
<i>left</i>	45	65	65
<i>right</i>	235	300	305
Eastbound	820	995	1040
<i>left</i>	235	300	310
<i>through</i>	585	695	730
Westbound	530	640	665
<i>through</i>	470	555	580
<i>right</i>	60	85	85
204th St SW at 44th Ave W			
Northbound	1390	1770	1790
<i>through</i>	1390	1770	1790
Southbound	880	1270	1305
<i>through</i>	880	1270	1305
Westbound	270	330	330
<i>left</i>	50	50	50
<i>right</i>	220	280	280
198th St SW at 44th Ave W			
Northbound	1115	1450	1475
<i>through</i>	1095	1425	1450
<i>right</i>	20	25	25
Southbound	925	1210	1220
<i>left</i>	20	25	25
<i>through</i>	905	1185	1195
Westbound	10	10	10
<i>right</i>	10	10	10

MLT Station Area AM peak hour 2035 Volumes

MLT Station Area AM peak hour 2035 Volumes

Intersection/Approaches	2035 No Build - Intersection Volumes	2035 Preferred Alternative - Intersection Volumes	2035 Preferred Alternative - Project Generated Trips	2035 Preferred Build - Percent Increase Over No build
I-5 SB CDR at 236th SW Street				
Eastbound	440	460	20	5%
<i>through</i>	240	260	20	8%
<i>right</i>	200	200	0	0%
Westbound	755	785	30	4%
<i>left</i>	565	575	10	2%
<i>through</i>	190	210	20	11%
I-5 NB OFF/ P&R at 236th SW Street				
Northbound	180	190	10	6%
<i>left</i>	50	50	0	0%
<i>through</i>	40	50	10	25%
<i>right</i>	90	90	0	0%
Southbound	85	145	60	71%
<i>left</i>	30	60	30	100%
<i>right</i>	55	85	30	55%
Eastbound	235	255	20	9%
<i>left</i>	120	140	20	17%
<i>through</i>	115	115	0	0%
Westbound	905	945	40	4%
<i>through</i>	660	660	0	0%
<i>right</i>	245	285	40	16%
56th Ave W at 236th SW Street				
Northbound	290	290	0	0%
<i>left</i>	95	95	0	0%
<i>through</i>	175	175	0	0%
<i>right</i>	20	20	0	0%
Southbound	420	430	10	2%
<i>left</i>	70	70	0	0%
<i>through</i>	240	240	0	0%
<i>right</i>	110	120	10	9%
Eastbound	240	280	40	17%
<i>left</i>	45	60	15	33%
<i>through</i>	150	170	20	13%
<i>right</i>	45	50	5	11%
Westbound	875	890	15	2%
<i>left</i>	100	100	0	0%
<i>through</i>	675	690	15	2%
<i>right</i>	100	100	0	0%

MLT Station Area PM peak hour 2035 Volumes

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
I-5 northbound ramps at 44th Ave W			
Northbound	780	1130	1145
<i>through</i>	620	955	970
<i>right</i>	160	175	175
Southbound	930	1325	1360
<i>left</i>	210	280	285
<i>through</i>	720	1045	1075
Eastbound	1040	1085	1090
<i>left</i>	770	815	820
<i>through</i>	155	155	155
<i>right</i>	115	115	115
I-5 southbound on-ramp at 44th Ave W			
Northbound	1610	2045	2070
<i>left</i>	200	200	200
<i>through</i>	1410	1845	1870
Southbound	1450	1885	1930
<i>through</i>	880	1270	1305
<i>right</i>	570	615	625
200th St SW at 44th Ave W			
Northbound	1410	1845	1870
<i>left</i>	270	350	375
<i>through</i>	820	1085	1085
<i>right</i>	320	410	410
Southbound	910	1185	1195
<i>left</i>	70	85	85
<i>through</i>	735	975	975
<i>right</i>	105	125	135
Eastbound	950	1150	1265
<i>left</i>	220	265	290
<i>through</i>	410	475	520
<i>right</i>	320	410	455
Westbound	745	900	930
<i>left</i>	395	500	500
<i>through</i>	290	330	360
<i>right</i>	60	70	70

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
200th St SW at 46th Ave W			
Northbound	500	530	360
<i>left</i>	155	165	125
<i>through</i>	5	5	5
<i>right</i>	340	360	230
Southbound	15	20	20
<i>left</i>	10	15	15
<i>through</i>	0	0	0
<i>right</i>	5	5	5
Eastbound	650	830	1075
<i>left</i>	5	5	5
<i>through</i>	600	775	1020
<i>right</i>	45	50	50
Westbound	645	805	870
<i>left</i>	115	120	75
<i>through</i>	525	675	785
<i>right</i>	5	10	10
200th St SW at 48th Ave W			
Northbound	300	320	880
<i>left</i>	125	130	355
<i>through</i>	150	160	250
<i>right</i>	25	30	275
Southbound	230	300	355
<i>left</i>	70	90	90
<i>through</i>	50	70	125
<i>right</i>	110	140	140
Eastbound	715	870	940
<i>left</i>	95	120	120
<i>through</i>	550	660	670
<i>right</i>	70	90	150
Westbound	685	845	925
<i>left</i>	20	25	215
<i>through</i>	550	670	550
<i>right</i>	115	150	160
200th St SW at 50th Ave W			
Northbound	400	525	540
<i>left</i>	40	55	55
<i>through</i>	120	165	165
<i>right</i>	240	305	320
Southbound	180	235	240
<i>left</i>	35	40	45
<i>through</i>	95	130	130
<i>right</i>	50	65	65
Eastbound	490	590	630
<i>left</i>	40	50	50
<i>through</i>	430	515	555
<i>right</i>	20	25	25
Westbound	710	860	970
<i>left</i>	150	190	215
<i>through</i>	510	610	690
<i>right</i>	50	60	65

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
196th St SW at 44th Ave W			
Northbound	1125	1460	1485
<i>left</i>	240	305	305
<i>through</i>	630	830	845
<i>right</i>	255	325	335
Southbound	725	955	960
<i>left</i>	165	205	205
<i>through</i>	505	680	685
<i>right</i>	55	70	70
Eastbound	1210	1460	1485
<i>left</i>	105	130	130
<i>through</i>	930	1110	1135
<i>right</i>	175	220	220
Westbound	1200	1440	1470
<i>left</i>	245	310	315
<i>through</i>	855	1005	1030
<i>right</i>	100	125	125
196th St SW at 50th Ave W			
Northbound	240	310	315
<i>left</i>	30	40	45
<i>right</i>	210	270	270
Eastbound	1285	1555	1585
<i>through</i>	1230	1480	1505
<i>right</i>	55	75	80
Westbound	1185	1435	1475
<i>left</i>	90	115	115
<i>through</i>	1095	1320	1360
196th St SW at 36th Ave W			
Southbound	735	945	955
<i>left</i>	325	445	445
<i>through</i>	260	295	300
<i>right</i>	150	205	210
Eastbound	1630	1985	2020
<i>left</i>	215	280	285
<i>through</i>	1345	1635	1665
<i>right</i>	70	70	70
Westbound	2150	2515	2545
<i>left</i>	400	410	410
<i>through</i>	1420	1665	1695
<i>right</i>	330	440	440
196th St SW at Poplar Way			
Northbound	315	420	420
<i>left</i>	275	325	325
<i>right</i>	40	95	95
Eastbound	2280	2745	2775
<i>through</i>	1000	1135	1155
<i>right</i>	1280	1610	1620
Westbound	795	1015	1045
<i>through</i>	795	1015	1045

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
I-5 Northbound off-ramp at Poplar Way			
Northbound	635	805	805
<i>left</i>	325	325	325
<i>through</i>	110	160	160
<i>right</i>	200	320	320
Southbound	1280	1610	1620
<i>left</i>	15	105	105
<i>through</i>	310	480	490
<i>right</i>	955	1025	1025
Eastbound	740	775	775
<i>left</i>	185	185	185
<i>through</i>	545	580	580
<i>right</i>	10	10	10
Westbound	195	250	250
<i>left</i>	155	155	155
<i>through</i>	20	20	20
<i>right</i>	20	75	75
196th St SW at 48th Ave W			
Northbound	405	525	625
<i>left</i>	105	130	160
<i>through</i>	225	300	355
<i>right</i>	75	95	110
Southbound	240	310	340
<i>left</i>	60	75	75
<i>through</i>	110	145	175
<i>right</i>	70	90	90
Eastbound	1355	1640	1665
<i>left</i>	160	200	200
<i>through</i>	1155	1390	1400
<i>right</i>	40	50	65
Westbound	1080	1305	1330
<i>left</i>	95	120	135
<i>through</i>	960	1155	1165
<i>right</i>	25	30	30

Lynnwood Station Area PM peak hour 2035 Volumes

Approaches	2012 Existing - Intersection Volumes	2035 No Build - Intersection Volumes	2035 Build - Intersection Volumes
196th St SW at 40th Ave W			
Northbound	325	420	435
<i>left</i>	40	55	55
<i>through</i>	65	90	95
<i>right</i>	220	275	285
Southbound	290	375	375
<i>left</i>	200	250	250
<i>through</i>	60	85	85
<i>right</i>	30	40	40
Eastbound	1300	1585	1620
<i>left</i>	40	55	65
<i>through</i>	1210	1460	1485
<i>right</i>	50	70	70
Westbound	1390	1675	1710
<i>left</i>	155	190	195
<i>through</i>	1150	1380	1410
<i>right</i>	85	105	105
200th St SW at 40th Ave W			
Southbound	280	365	370
<i>left</i>	45	65	65
<i>right</i>	235	300	305
Eastbound	820	995	1040
<i>left</i>	235	300	310
<i>through</i>	585	695	730
Westbound	530	640	665
<i>through</i>	470	555	580
<i>right</i>	60	85	85
204th St SW at 44th Ave W			
Northbound	1390	1770	1790
<i>through</i>	1390	1770	1790
Southbound	880	1270	1305
<i>through</i>	880	1270	1305
Westbound	270	330	330
<i>left</i>	50	50	50
<i>right</i>	220	280	280
198th St SW at 44th Ave W			
Northbound	1115	1450	1475
<i>through</i>	1095	1425	1450
<i>right</i>	20	25	25
Southbound	925	1210	1220
<i>left</i>	20	25	25
<i>through</i>	905	1185	1195
Westbound	10	10	10
<i>right</i>	10	10	10

APPENDIX D

I-5 Collision Data

Collision Type	Northbound I-5		Southbound I-5	
	Frequency	Percent	Frequency	Percent
Rear-End	623	61%	1169	72%
Sideswipe	200	20%	217	13%
Fixed Object - Bridge Rail, Concrete Barrier	70	7%	85	5%
Fixed Object - Guard Rail, Crash Cushion	33	3%	37	2%
Fixed Object - Ditch, Wall	14	1%	16	1%
Fixed Object - Pole, Street Light, Sign Post, Control Gate	15	1%	16	1%
Same Direction - all others	47	5%	46	3%
Fixed Object - other	7	1%	13	1%
Parked Vehicle	5	0%	3	0%
Vehicle overturned	6	1%	12	1%
Pedestrian	1	0%	1	0%
Opposite direction	3	0%	2	0%
	1024		1617	

Roadway Surface Conditions I-5 Mainline Accidents, 2010-2013		
	Northbound I-5	Southbound I-5
Dry	761	1003
Wet	223	578
Ice	9	14
Snow/Slush	21	16
Standing Water	7	6
Other	2	
Unknown	1	
	1024	1617

Lighting Conditions I-5 Mainline Accidents, 2010-2013		
	Northbound I-5	Southbound I-5
Dark - No Street Lights	69	64
Dark - Street Lights Off	14	3
Dark- Street Lights On	206	281
Dawn	4	52
Daylight	690	1182
Dusk	35	26
Unknown	6	9
	1024	1617

Accident Time of Day I-5 Mainline, 2010-2013		
Hour	Northbound I-5	Southbound I-5
Midnight	6	12
1:00 AM	7	4
2:00 AM	16	6
3:00 AM	11	7
4:00 AM	6	13
5:00 AM	10	22
6:00 AM	14	126
7:00 AM	21	145
8:00 AM	19	156
9:00 AM	18	119
10:00 AM	17	59
11:00 AM	20	44
Noon	40	82
1:00 PM	36	104
2:00 PM	71	110
3:00 PM	139	124
4:00 PM	178	123
5:00 PM	168	134
6:00 PM	117	105
7:00 PM	32	33
8:00 PM	14	26
9:00 PM	22	24
10:00 PM	27	23
11:00 PM	15	16
	1024	1617

Table
I-5 Mainline Accidents (2010 through 2013)
Sound Transit Lynnwood Link Project

	Milepoint												
	Beginning	End	Segment Length	ADT	Total Crashes	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Total Crash Rate, per MVM	Fatality Rate, per 100 MVM	Injury Rate, per MVM	Injury Crash Rate, per MVM
Northbound Mainline													
N 92nd St Bridge to NB Off ramp to Northgate	171.89	172.49	0.60	87210	25	0	7	0	8	0.33	0	0.10	0.09
NB off ramp to Northgate to NB off ramp to 130th Si	172.49	173.66	1.17	102560	108	0	30	0	48	0.62	0	0.27	0.17
NB Off ramp to 130th IC to NB off ramp to 145th IC	173.66	174.33	0.67	90990	91	0	31	0	57	1.02	0	0.64	0.35
NB off ramp to 145th IC to NB off ramp to Metro Base	174.33	175.45	1.12	90330	153	0	54	0	94	1.04	0	0.64	0.37
NB off ramp to Metro Base to NB off ramp to 175th IC	175.45	176.04	0.59	89930	78	0	26	0	35	1.01	0	0.45	0.34
NB off ramp to 175th IC to NB off ramp to SR 104	176.04	177.52	1.48	86530	132	1	46	1	66	0.71	0.53	0.35	0.25
NB off ramp to SR 104 to NB off ramp to 236th IC	177.52	178.09	0.57	72080	66	0	28	0	34	1.10	0	0.57	0.47
NB off ramp to 236th IC to NB HOV off ramp to Transit Stator	178.09	178.34	0.25	83290	28	0	9	0	13	0.92	0	0.43	0.30
NB HOV off ramp to Transit Station to NB off ramp to 220th IC	178.34	179.1	0.76	83290	58	0	17	0	26	0.63	0	0.28	0.18
NB off ramp to 220th IC to NB off ramp to 44th Ave W IC	179.1	180.52	1.42	92700	124	0	42	0	53	0.65	0	0.28	0.22
NB off ramp to 44th Ave W IC to NB off ramp to 196th/SR 524	180.52	181.32	0.80	89990	84	0	23	0	35	0.80	0	0.33	0.22
NB off ramp to 196th/SR 524 to NB off ramp to I-405/SR 525	181.32	182.2	0.88	94450	77	0	22	0	35	0.63	0	0.29	0.18
			10.31	88613	1024	1	335	1	504	0.77	0.07	0.38	0.25

	Milepoint												
	Beginning	End	Segment Length	ADT	Total Crashes	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Total Crash Rate, per MVM	Fatality Rate, per 100 MVM	Injury Rate, per MVM	Injury Crash Rate, per MVM
Southbound Mainline													
N 92nd St Bridge to SB on ramp at Northgate IC	171.89	172.54	0.65	89130	95	0	34	0	59	1.12	0	0.70	0.40
SB on ramp from Northgate IC to SB on ramp from 130th IC	172.54	173.67	1.13	97400	444	0	138	0	211	2.76	0	1.31	0.86
SB on ramp from 130th IC to SB on ramp from 145th IC	173.67	174.39	0.72	89380	177	0	56	0	82	1.88	0	0.87	0.60
SB on ramp from 145th IC to SB on ramp from Metro Base	174.39	175.44	1.05	83410	193	0	57	0	100	1.51	0	0.78	0.45
SB on ramp from Metro Base to SB on ramp from 175th IC	175.44	176.02	0.58	83150	27	0	7	0	9	0.38	0	0.13	0.10
SB on ramp from 175th IC to SB on ramp from SR 104 IC	176.02	177.64	1.62	81990	105	1	21	1	29	0.54	0.52	0.15	0.11
SB on ramp from SR 104 to SB off ramp to SR 104 IC	177.64	178.29	0.65	66780	103	0	32	0	43	1.63	0	0.68	0.50
SB off ramp to SR 104 to SB on ramp from 220th IC	178.29	179.45	1.16	82470	96	1	30	1	38	0.69	0.72	0.27	0.21
SB on ramp from 220th IC to SB on ramp from 44th Ave W IC	179.45	180.63	1.18	87590	191	0	62	0	83	1.27	0	0.55	0.41
SB on ramp from 44th Ave W IC to SB on ramp from 196th/SR 524 IC	180.63	181.07	0.44	87240	76	0	18	0	25	1.36	0	0.45	0.32
SB on ramp from 196th/SR 524 to SB off ramp to 196th/SR 524	181.07	182.2	1.13	68500	110	0	38	0	55	0.97	0	0.49	0.34
			10.31	83367	1617	2	493	2	734	1.29	0.16	0.58	0.39

Notes:
Total and Injury Rates are expressed per million vehicle miles (MVM)
Fatality Crash Rates are expressed per 100 MVM

Summary Ramps Table
2010-2013 Data for I-5 Ramps, MP 172-182

Northbound Ramps	Exit Number	Segment Length	ADT	Total Crashes	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Total Crash Rate, per MVM	Fatality Rate, per 100 MVM	Injury Rate, per MVM	Injury Crash Rate, per MVM	Crash Type						
													Rearend	Sideswipe	Fixed Object	Left-turn	Right Angle	Vehicle Overturned	Pedestrian or Bicycle
Express Lanes Off ramp to NE 103rd Street	173	0.54	4240	26	0	10	0	16	7.78	0	4.79	2.99	X	X		X			
Off ramp to 1st Ave NE at NE 107th Street		0.3	14910	29	0	10	0	16	4.44	0	2.45	1.53	X	X					
On ramp from 1st Ave NE at NE 107th Street		0.36	10640	19	0	3	0	4	3.40	0	0.72	0.54	X	X					
On ramp from Northgate Way at 1st Ave NE		0.22	2650	9	0	3	0	3	10.57	0	3.52	3.52	X	X					
Off ramp to 5th Ave NE (130th)	174	0.23	8100	18	0	7	0	9	6.62	0	3.31	2.57	X				X		
Off ramp to 5th Ave NE (145th)	175	0.22	11940	22	0	7	0	11	5.74	0	2.87	1.83	X				X		
On ramp from 5th Ave NE		0.32	10680	23	0	11	0	20	4.61	0	4.01	2.20	X	X		X			
Off ramp to NE 175th Street	176	0.37	14490	14	0	7	0	7	1.79	0	0.89	0.89	X	X					
On ramp from NE 175th Street		0.12	8640	5	0	3	0	5	3.30	0	3.30	1.98	X	X					
Off ramp to SR 104	177	0.35	11630	6	0	1	0	1	1.01	0	0.17	0.17			X				
C-D Roadway		1.13	21120	47	0	15	0	19	1.35	0	0.55	0.43	X	X	X				
EB to NB Loop On-Ramp		0.19	8070	6	0	4	0	4	2.68	0	1.79	1.79			X				
NB to WB Loop Off-Ramp		0.12	7550	3	0	0	0	0	2.27	0	0.00	0.00			X				
On ramp from SR 104		0.18	5500	6	0	1	0	1	4.15	0	0.69	0.69	X		X				
Off ramp to 236th	178	0.34	4650	5	0	0	0	0	2.17	0	0.00	0.00	X		X				
Off ramp to 220th SW	179	0.32	8550	2	0	1	0	4	0.50	0	1.00	0.25	X						
On ramp from 220th SW		0.18	15110	12	0	3	0	4	3.02	0	1.01	0.76	X	X					
Off ramp to 44th Ave W	181A	0.44	12540	18	0	2	0	3	2.23	0	0.37	0.25	X	X					
Off ramp to Poplar Way/196th	181B	0.37	7680	7	0	3	0	3	1.69	0	0.72	0.72	X		X	X	X		
Poplar Way Loop On Ramp		0.28	17280	16	0	1	0	2	2.26	0	0.28	0.14	X	X	X				
On ramp from 196th/SR 524		0.1	5810	7	0	1	0	1	8.25	0	1.18	1.18	X						
Southbound Ramps	Exit Number	Segment Length	ADT	Total Crashes	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Total Crash Rate, per MVM	Fatality Rate, per 100 MVM	Injury Rate, per MVM	Injury Crash Rate, per MVM	Crash Type						
													Rearend	Sideswipe	Fixed Object	Left-turn	Right Angle	Vehicle Overturned	Pedestrian or Bicycle
On ramp from CD and Corliss	173	0.52	12580	27	0	9	0	11	2.83	0	1.15	0.94	X	X	X	X	X		
Off ramp (loop) to EB Northgate Way		0.18	6140	21	0	7	0	9	13.01	0	5.58	4.34	X	X	X				
Off ramp to Northgate Way and CD		0.2	14530	36	0	10	0	13	8.49	0	3.06	2.36	X	X	X	X			X
On ramp from NE 130th Street	174	0.32	7630	7	0	2	0	3	1.96	0	0.84	0.56	X		X				
On ramp from NE 145th Street	175	0.44	10940	5	0	1	0	1	0.71	0	0.14	0.14	X	X	X				
Off ramp to NE 145th Street		0.21	12190	21	0	7	0	9	5.62	0	2.41	1.87	X	X					
On ramp from NE 175th Street	176	0.4	9250	3	0	0	0	0	0.56	0	0.00	0.00	X						
Off ramp to NE 175th Street		0.25	6670	9	0	1	0	1	3.70	0	0.41	0.41	X		X				
On ramp from SR 104 and 236th	177	0.59	12720	36	0	12	0	13	3.29	0	1.19	1.10	X	X	X			X	
Off ramp to SR 104		0.68	13860	9	0	1	0	1	0.65	0	0.07	0.07			X				
On ramp from 220th Street SW	179	0.45	8550	9	0	2	0	2	1.60	0	0.36	0.36	X						
Off ramp to 220th Street SW		0.22	12610	23	0	5	0	5	5.68	0	1.23	1.23	X		X				
On ramp from 44th Ave W	181A	0.73	11700	11	0	4	0	5	0.88	0	0.40	0.32	X	X					

